Explicit Versus Implicit Spelling Strategy Instruction and its Effects on Grade One Children's Invented Spellings

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Abstract

The intent of this study was to investigate the effectiveness of teaching thirty-five Grade One children a variety of effective spelling strategies in comparison to traditional spelling instruction. Strategy instruction included training in phonology, imagery and analogy. In addition, the type of instruction provided (implicit versus explicit) was also examined. Children were seen in small groups of four or five, for four, twenty-five minute sessions. All children were tested prior and immediately following the training sessions, as well as at 14-day follow-ups. Pretest and posttest measures included a dictated spelling test (based on words used in training), a developmental spelling test and a sample of each child's writing. In addition, children completed a metacognitive spelling test as a measure of their strategy awareness. Performance scores on the pretest and posttest measures were compared to determine if any differences existed between the three spelling instruction groups using the Dunn-Bonferroni and Dunnett procedures. Findings revealed that explicit strategy instruction was the most effective spelling program for improving Grade One children's invented spellings. Children who received this instruction were able to spell targeted words more accurately, even after a 14-day follow-up, and were able

to recall more effective spelling strategies than children who received either implicit strategy instruction or traditional strategy instruction.

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Table of Contents

(continues)

List of Tables

CHAPTER ONE: THE PROBLEM

Introduction

This study investigated the effectiveness of teaching Grade One children multiple spelling strategies in comparison to providing traditional spelling instruction. In addition, this study investigated two types of multiple strategy instruction: explicit versus implicit.

Background of the Problem

In many primary classes today, children are provided with numerous opportunities to write and are encouraged to create their own spellings (often referred to as "invented spellings": Read, 1971). However "bizarre" or "strange" these spellings appear to adults, recent insights into young children's writings have revealed that these writings are systematic and reflect children's current understandings of language sound structures (Read, 1971, 1975, 1986). Specifically, researchers have documented five developmental stages through which most children progress when learning to spell (Gentry, 1987; Henderson & Templeton, 1986; Hodges, 1982).

In the very early stage of writing, children simply scribble or write a random chain of letters to represent words. Gradually, they realize that certain letters symbolize specific sounds and begin to spell

"alphabetically," matching sounds and letters systematically (e.g., "ran" for "rain"). As children's sight vocabularies grow, an increasing number of correctly spelled words appear in their writings. In addition, children become aware of within-word vowel patterns (e.g., "ee" makes a long "e" sound), and other conventions of spelling (e.g., doubling of consonants to maintain the short vowel). As children approach adolescence, they become increasingly aware of more complex patterns, such as derivational patterns where the spellings of related words are derived from root words (e.g., "sign" from "signal"). Throughout adulthood, their spelling skills continue to be refined. Thus, the process of learning to spell can be viewed as progressive and orderly, beginning with the discovery of written language and letter-sound correspondences, with children progressively differentiating the alphabetic system into patterns and meaningful relationships.

With such insights into spelling development, teachers can no longer view spelling instruction as the process of memorizing lists of words for weekly spelling tests. Instead, teachers must design spelling programs sensitive to each child's developmental stage. Furthermore, spelling instruction should provide children with a repertoire of effective spelling strategies.

This study will examine the effectiveness of multiple spelling strategy programs in comparison to traditional spelling program. In addition, the effectiveness of explicit and implicit instruction will also be examined. Briefly, explicit, multiple spelling strategy instruction involves training children in the use of various strategies in addition to providing them with metacognitive information about how, when, where and why to use these strategies. Implicit instruction simply involves training children in the use of various spelling strategies. According to Pressley (1988), appropriate use of strategies can occur only when children possess detailed knowledge about how, when, and where to use strategies. Providing students with programs that contain metacognitive information about strategies improve children's performances on various academic tasks such as early reading skills and reading comprehension (Schneider, 1985; Cross & Paris, 1988; Evans, Taylor & Blum, 1979).

Thus, it was expected that providing children with effective spelling strategies and direct explanations about the use of these strategies (explicit, multiple strategy instruction) would produce greater gains in spelling performance than would simply providing children with effective spelling strategies (implicit, multiple-strategy instruction). It was also expected

that both explicit and implicit multiple strategy instruction would produce greater gains in spelling than traditional spelling instruction.

Statement of Research Questions

The following hypotheses were investigated:

1) Both implicit and explicit multiple strategy instruction would produce greater spelling gains relative to the traditional spelling instruction as measured by a Developmental Spelling Test, a Dictated Spelling Test and systematic analysis of writing samples;

2) Explicit strategy instruction would produce greater gains in spelling performance relative to implicit strategy instruction as measured by a Developmental Spelling Test, a Dictated Spelling Test and systematic analysis of writing samples;

3) Explicit multiple strategy instruction would promote greater awareness of spelling strategies relative to either implicit multiple spelling instruction and traditional spelling instruction as measured by a test of spelling metacognition.

Importance of the Study

Many teachers today are faced with the question, "How do I teach spelling?" Controversy exists about

which of the "new" practices should be used and which of the "old" ones should be discarded. Many teachers continue to teach spelling the way they were taught to spell, through textbook lists of words and workbook exercises. Yet others, believing that they are taking a "newer" approach to spelling, select their list of words from themes or units, but then proceed with traditional spelling practices. In order to make decisions about effective spelling programs, teachers need to possess knowledge about the developmental stages and effective spelling strategies. With this knowledge, teachers can make effective decisions about "how" and "what" to change about spelling programs with confidence to enhance students' learning.

This study has been carried out with the intent of making teachers and educators more aware of spelling development. In addition, it is hoped that this study will provide teachers with knowledge about effective spelling strategies. Moreover, this study will provide teachers with a practical means by which they can implement strategy instruction in their spelling programs.

Definition of Terms

Developmental Stage - a qualitatively distinct level of development with specific characteristics that reflect natural growth

Strategy - is an operation or sequence of operations which can be conducted in order to complete a task.

Phonology - a strategy used to spell words in which one must carefully attend to the sounds (phonemes) in words and represent these sounds with the appropriate letter or pattern of letters.

Imagery - a strategy used to spell words in which one uses the visual image (shape, order of letters) of a word to remember how to spell a word.

Analogy - a strategy used to spell words in which one uses part of a known word to spell and unknown word.

Metacognition - is the knowledge and skills involved in knowing what a strategy is, how to carry it out, and knowing when and why to use a particular strategy (Cross & Paris, 1988).

Traditional Spelling Instruction - involves teaching children to spell by having them write out target words, use these words in sentences, and complete "fill in the blank" exercises.

Implicit Strategy Instruction - involves instruction in which children are provided with activities which are based on effective strategies.

Explicit Strategy Instruction - involves direct instruction about what a specific strategy is, why to use it, and how, when, and where to effectively apply that particular strategy in addition to providing children with activities which are based on effective strategies.

Scope and Limitations of the Study

To reiterate, the purpose of this study was to investigate the effectiveness of teaching Grade One children multiple spelling strategies in comparison to traditional spelling instruction. As outlined in the methodology, children received multiple spelling strategies (phonology, imagery and analogy) at each training session. Therefore, the results of the study only reflected the effectiveness of a multiple spelling strategy program. It was impossible to determine whether one strategy was more effective than another. However, the strategies chosen for this study were selected on the basis that they have previously been demonstrated to improve children's spelling performances. Thus, there was no need to determine the

effectiveness of one strategy over another.

Outline of Remainder of Document

The literature reviewed in the following chapter clearly defines the five developmental stages through which most children progress when learning to spell. Research supporting the use of phonology, imagery and analogy as effective spelling strategies is reviewed. In addition, a review of the literature on metacognition is presented outlining the key features of explicit strategy instruction.

Chapter three outlines the research design used in this study and provides a rationale for this design. Subject selection, procedures and materials used in the training programs and data-gathering procedures are also outlined. Finally, procedures for data analysis are also discussed.

Chapter four discusses the results of the study with reference to limitations within the design. Ultimately, conclusions and implications are drawn in Chapter five with recommendations for further research in this area.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Introduction

What do you do when you do not know how to spell a word? Consider the word "circumstantially." To begin, you might try to "sound out" the word (e.g., circumstansialy). You may even realize that the word "circle," "circus," or "circumstance" is the base word for "circumstantially" and attempt to spell it "circumstancially." But somehow these attempted spellings just do not "look right." So you will probably proceed to grab a piece of scrap paper and write out several versions of the word and select one of the responses. In addition, you might discard these strategies and refer to a dictionary, a computer spell-checker, or the advice of someone nearby. Eventually you will hopefully obtain the correct spelling.

Looking back at your attempts to spell the word, "circumstantially," you will probably find that you used a variety of strategies (e.g., sounding the word out and writing several versions of the word on paper). You might also find that there were strategies that you used to spell this word that you would not use to spell another word (e.g., "sounding out" would not be an effective strategy for spelling the word, "chihuahua"). Thus, to spell the word "circumstantially," you probably relied on a variety of strategies that you had

available to you, selecting the strategies that would be effective in this situation.

Research in spelling and its development has found that good spellers report using a variety of strategies to spell difficult words (Yee, 1969 as cited in Woloshyn & Pressley, 1990) and can apply these strategies in different situations. Poor spellers, however, report using only one strategy, "sounding out" across every situation.

The intent of this study was to investigate the effectiveness of teaching young children a variety of effective spelling strategies in comparison to traditional spelling instruction. Strategy instruction will include phonology (sounding out), imagery, and analogy. In addition, the type of strategy instruction provided (i.e., explicit versus implicit) was also examined. It was proposed that instruction which includes teaching in specific spelling strategies combined with explicit discussions and experiences about how and when to directly apply these strategies (explicit instruction) would result in greater improvement in spellings than would a spelling strategy instruction alone, or traditional language arts activities.

Until recently, research in the study of spelling has been relatively neglected, perhaps because it has

seemed that spelling was largely the process of memorization and recall (Scott, 1987). If a word could not be spelled by sounding it out, it had to be memorized. Thus, spelling instruction consisted of memorizing lists of words for weekly spelling quizzes. However, insights about the underlying patterns of the English spelling system (Chomsky & Halle, 1968 as cited in Scott, 1987; Venezky, 1970 as cited in Scott, 1987), reveal that learning to spell reflects a gradual shift from a reliance on phonics to a more abstract lexical or meaning level. For example, children may begin to spell by sounding out words but may later rely on language patterns (e.g., the sound "e" can be represented by "ee," "ea," and "e"; Henderson & Templeton, 1986). Children can also rely on meaning to help them spell (Henderson & Templeton, 1986). Words that have the same meaning tend to be spelled the same way (e.g., know-knowledge). When viewed this way, English orthography can be seen as an essentially orderly system (Scott, 1987). Thus, recent research in spelling has focused on how spelling develops and the linguistic reasons for this development (Read, 1971, 1975, 1986; Henderson, 1985).

Of particular interest to researchers are the very early invented spellings created by young children prior to formal instruction in reading and writing. By

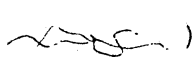
analyzing the writing productions of preschool and kindergarten children, Read (1971, 1975, 1986) found that children composed words and messages by inventing their spellings as they went along. He also found that these spellings were systematic and reflected children's current understanding of the sound structures that compose the English language (as cited in Tarasoff, 1990). According to Read (1986), when children attempt to spell a word that they do not know, they have to analyze the word into sounds (phonemes) and represent each sound with a letter or groups of letters. As children become aware of more sounds and letter patterns, their spellings will change.

Other researchers (Henderson & Templeton, 1986, Gentry, 1987; Hodges, 1982) have examined the invented spellings of children of various ages and have found that most children's spellings changes systematically over time. Specifically, Henderson and Templeton (1986) have documented five developmental stages through which most children's spelling progresses.

Five Developmental Stages of Spelling

Stage One - Preliterate Word Knowledge

Stage One reflects children's understanding of written language before learning to read or write. At

this stage, Henderson and Templeton (1986) state that children will scribble freely (e.g., ), make markings on paper, gradually move to pictures (e.g., ), and finally print letters (e.g., KJLMPOX). Though, when Stage One children write with letters they will simply write a chain of random letters with no sound correspondences (e.g., PHLDQRSTBKMZ). According to Henderson and Templeton (1986), children who create this kind of writing have learned about stories, know what writing is, and know how to write letters and the names of letters. Simply, their spellings reflect their concepts of form and functions of print.

Stage Two - Letter-Name Spelling

Stage Two reflects children's knowledge of language at approximately late kindergarten, Grade One and early Grade Two. Children at this stage have grasped the concept of "word" and will begin to spell alphabetically, matching sounds and letters systematically (e.g., "ran" for "rain"; Scott, 1987). According to Henderson and Templeton (1986) children will select letters to spell words on the basis of the letter's name: "U" for "you," "B" for "be," "R" for "are." Children at this stage often detect features of sounds to which adults no longer attend. For example,

they will spell "try" with "ch" which is actually more phonetically correct than "tr" (Henderson & Templeton, 1986).

Consistent patterns in children's invented spellings have also been noted when representing short vowels. According to Henderson and Templeton (1986), children at this stage of development tend to substitute the name-letter vowel that is closest to the point of articulation in the mouth as the specific short vowel. That is, they are very close in shape in the mouth when children pronounce them. To children, the vowel in "pin" seems very close to the vowel name "e" and children will spell "pin" as "pen." Likewise, short "a" is substituted correctly with "a," short "e" with "a," short "i" with "e," short "o" with "i," short "u" with "o," and "oo" with "u." When making these substitutions, children are relying on their natural sense of sound discrimination (Henderson, 1985).

Another interesting characteristic of children's letter-name spelling is their tendency to leave out the consonant letters "m" and "n" when these come before a final consonant (Henderson & Templeton, 1986). They will spell "went" as "wet" and "sink" as "sek." Treiman (1991) found that children also omit consonants in clusters at the beginning of words as well. For example, some children may spell "play" as "pay." She

found that with final clusters (e.g., "nt" as in "went"), children tend to group the first consonant of the cluster (n) with the preceding vowel and spell the final cluster with a single letter (e.g., "nt" as "t"). When the cluster is at the beginning of the word (e.g., "pl" as in "play"), children tend to treat the two consonants of the cluster as one unit and will spell it with a single letter (in this case, "pay").

Children at this stage also face an interesting dilemma when they try to spell words like "letter," "later," "madder," and "ladder" (Henderson & Templeton, 1986). In these words, the medial "t" and "d" happen to be articulated identically. Here, children have to simply guess on the basis of sound discrimination. For example they may spell "later" as "latr" or "ladr."

Stage Three - Within-Word Pattern

Stage Three reflects children's knowledge of language at approximately late Grade Two and Grade Three. As children's sight vocabularies grow, increasing numbers of correctly spelled words will appear in their writings (Henderson & Templeton, 1986). These words will start to influence children's strategies for their invented spellings. For example, the simple letter-name spelling of "ran" for "rain" no

longer "looks right" and the child may then spell it "raen" (Henderson, 1985).

The second major change in children's spelling is the appearance of correctly spelled short vowels (Henderson & Templeton, 1986). Along with this change is a greater accuracy in the spelling of blends (e.g., "st," "bl," "pl," and "tr"). The initial letters of final clusters (e.g., the "n" in "went") are no longer omitted, and children's writing begins to look more like standard, conventional spelling.

According to Henderson and Templeton (1986) children at this point are ready to learn about the "within-word" vowel patterns of English spelling. It is no longer sufficient for children to think of words as letters matching sounds one at a time, but rather as patterns of letters in relation to sound (Henderson, 1985). Children learn that the sound that a letter or letters represent within a syllable depends on its position in the word and on the other letters that surround it. A common example is the long vowel pattern signaled by a final "e" as in "skate." According to Henderson and Templeton (1986), children learn this pattern early. The sound that "a" represents in this pattern depends on its environment. When children know that such patterns exist, they can easily master these patterns and can learn that it is these patterns that

they must search out, attend to and learn (Henderson, 1985).

Children at this stage also learn the relationship between within-word patterns and word meaning (Henderson & Templeton, 1986). Here, the meaning of a word fixes a particular spelling. This is based on the fact that words or parts of words having the same meaning tend to be spelled the same. For example, children will learn that "ed" signifies the past tense whether it is pronounced "d" as in "played" or "t" as in "jumped." The meaning components of simple prefixes and suffixes are also explored (Henderson & Templeton, 1986).

Stage Four - Polysyllabic Words

Most children do not reach this stage until the junior division (Grades 4-6; Henderson & Templeton, 1986). At this stage, Henderson and Templeton (1986) note that children will become aware of more conventions that guide spelling where syllables join together: for example, the doubling of consonants to mark or maintain the short vowel (e.g, pat--patted); also, the keeping of a single consonant to maintain the long vowel (e.g, skate-skated). Children at this stage will also become aware of other conventions such as doubling the final single consonant when the preceding syllable is stressed: (e.g, refer - referring, versus conquer -

conquering; Henderson & Templeton, 1986).

Stage Five - Derivational Spelling

This stage corresponds to students at around Grade Seven level and continues into adulthood (Henderson & Templeton, 1986). At this stage, children synthesize their knowledge of spelling and are able to cope with derivational relationships or instances in which related words are derived from base or root words (Henderson & Templeton, 1986). One pattern that illustrates this principle is the silent versus sounded consonant in related words. For example, the silent "g" in "sign" can be understood by noting the similarity in spelling in words to which they are related in meaning, including "signal" and "signature." Despite variations in sound across these words, the visually similar spellings preserve their semantic relationship (Henderson, 1985).

Children at this stage are also able to handle vowel "alternations" -- changes in pronunciation from a "long" vowel sound to a "short" sound or vice verse (Henderson & Templeton, 1986). Research suggests that these alternations are learned in sequence (e.g., Templeton, 1979). Students begin with words in which an accented long vowel in a root word changes to a short vowel in the accented syllable of a derived word (e.g., divine-divinity; Henderson & Templeton, 1986). Once

students have grasped this pattern, they learn derivational relationships in which the long vowel in a root word alternates with a "reduced" vowel or "schwa" in derived words (e.g., define-definition, compose, composition; Templeton, 1979).

Another pattern involves words in which a short vowel alternates with a "schwa" as in "local" - "locality", "image"-"imagine" (Henderson & Templeton, 1986). Students who are unsure of the spelling in "local," can examine the spelling of the vowel in "locality" in which the sound is clearly heard. A fourth pattern of vowel alternation entails changes in spelling among related words, but these changes are regular and predictable (e.g., explain-explanation, receive-reception; Henderson & Templeton, 1986).

Henderson and Templeton (1986) state that as students examine vowel alternation patterns, they also learn patterns of consonant alternations. In the first pattern, there is a change in pronunciation although the spelling remains the same (e.g., critic-criticize; attract-attraction). A second consonant alternation pattern involves a change in both sound and spelling (e.g., adolescent - adolescence; decide-decision). Students studying these elements will become aware of a "sense" or "feel" for the root or base as a meaningful element or unit which, according to Henderson and

Templeton (1986), is a very important aspect of spelling.

Having reviewed these five stages, the process of learning to spell can now be viewed as a progressive, orderly system beginning with the discovery of written language and letter sound correspondences, with students progressively differentiating the alphabetic system into patterns and meaningful relationships. This knowledge is then applied to polysyllabic words with refinement continuing throughout adulthood (Scott, 1987). See Table 1 for a summary and examples of the five developmental stages of spelling.

Progression Through Spelling Stages

As with all other developmental stage theories (e.g., Piaget's Cognitive-Developmental theory, Kohlberg's theory of Moral Development, and Freud's Psychoanalytic theory), the five developmental stages of spelling are believed to represent universal sequences of development (Lerner, 1986). It is understood that most learners pass through these series of qualitatively different developmental levels and that the ordering of these stages is invariant (Flavell, 1971). That is, most learners do not skip stages or progress through them in a different order.

Most learners, however, will differ in their

Table 1
Five Developmental Stages of Spelling
(Henderson & Templeton, 1986)

STAGE	DESCRIPTION	EXAMPLE
STAGE 1 reschool-	- reflects child's understanding of written language before learning to read or write. - child will scribble, draw pictures, letters and then chains of random letters.	-  -  - RJKP02X
TAGE 2 ate K, r. 1 arly Gr.2	"Letter-Name" Stage A child at this stage: - has grasped the concept of "word" and will begin to spell alphabetically. - will match sounds to letter names and will spell using letter sounds. - will detect features of sounds to which adults no longer attend. - will substitute short vowels with letter vowel that is closest to the point of articulation in the mouth as the specific short vowel (a-a, e-a, i-e, o-i, u-o, oo-u). - will leave out first letter of final clusters and second letter of initial clusters. - medial t's and d's in words such as "ladder" and "matter" are articulated the same. Therefore children simple chose t or d to represent the sound.	— "ran" for "rain" "u" for "u" "b" for "be" "r" for "are — "ch" in the word "train" — spell "pin" as "pen" — spell "went" as "wet" spell "play" as "pay" spell "ladder" as "latr"

(table continues)

STAGE	DESCRIPTION	EXAMPLE
STAGE 3 late Gr. 2 Gr. 3	- child's sight vocabulary is increasing and they will tend to spell these words correctly when writing. - child has developed newer strategies for invented spelling based on increased visual experiences with print. Child will add or insert letters in words because they do not "look right." - will show greater accuracy in spelling of blends. - will no longer omit first letter of final clusters or second letter of initial clusters. - is aware of more in-word patterns. - is aware of word-patterns based on meaning.	- will now spell "rain" as "rean" not "ran" - will now spell "play" correctly - "ee," "ea", "ou", (etc.) vowel combinations the word "played" is based on "play" plus the ending "ed"
STAGE 4 Gr. 4-6	- is aware of syllable joining principles: - doubling consonant to maintain a short vowel sound. - using single consonant to maintain a long vowel sound. - doubling consonant when preceding syllable is to be stressed.	- "pet" - "petted" "put" - "putting" - "skate" - "skating" "rain" - "raining" - "refer" - "referring" "conquer" - "conquering"

(table continues)

STAGE	DESCRIPTION	EXAMPLE
STAGE 5 Gr. 7 and above	- child will synthesize his/her accumulated knowledge of spelling.	
	- is able to cope with derivational relationships - related words derived from base or root words.	"sign" - "signal" - "signature"
	- is able to handle vowel alterations. These alterations are learned in sequence:	
	1) an accented long vowel in base word changes to a short vowel in the accented syllable of a derived word.	- "define" - "definition" "compose" - "composition"
	2) a long vowel in a root word alternates with a reduced vowel or "Schwa" in the derived word.	- "local" - "locality" "image" - "imagine"
	3) a short vowel alternates with the "schwa."	- "explain" - "explanation" "receive" - "reception"
	4) is aware of changes in spelling among related words and that these changes are regular and predictable.	- "critic" - "criticize" "attract" - "attraction"

development in two ways (Emmerich, 1968 as cited in Lerner, 1986). First, people may differ in their rate of progression through the stages. For instance, it may take one child one year to pass through Stage Two -the letter-name stage, and another child two years to pass through the same stage. The second way that people may differ within developmental stage theories, is with respect to the final level of development that they reach (Emmerich, 1968 as cited in Lerner, 1986). For example, a child with a severe learning disability may not progress past Stage Three of spelling development.

In addition, Lerner (1986) notes that one should not view the passage through developmental stages as a series of qualitative leaps in steplike functions. Rather, transitions from one stage to the next are gradual-they take place slowly over time. Because people progress from one stage to another gradually, they will demonstrate behaviours that are representative of more than one stage at the same time (Lerner, 1986). A skill from a former stage may be completing its development while, at the same time, a new skill from the present stage can also be developing. For example, a child may be using correct spellings for familiar words in his/her writings (characteristic of Stage Three) while still using letter names to spell unfamiliar words (characteristic of Stage Two). This

"mixing of stages" is an essential component of any adequate theory of development (Flavell, 1971).

Insights into spelling development can provide teachers with a strong basis on which to build an effective spelling program. Teachers who are knowledgeable about the patterns in the English language and who are sensitive to the developmental stages of spelling growth, can provide children with appropriate spelling strategies, thus enhancing their spelling abilities.

Of particular interest to this study were the spellings of children before and during the early stages of formal instruction in reading and writing (e.g., Stages One and Two). Grade One children will probably demonstrate spelling behaviours representative of either Stage One (Pre-literate stage) and/or Stage Two (Letter-name stage). Children may also be beginning to develop spelling behaviours representative of Stage Three (Within-Word Pattern Stage). Thus, some children will still be learning the letter names and sounds and how to use these in their writings while other children will use only letter names to spell, with still other children using correctly spelled words in their writings. Therefore, the range of spelling behaviours of children at this level can vary greatly. Thus, it is important that, when developing an effective spelling

instruction program, a variety of developmentally appropriate spelling strategies be taught. Phonology, analogy, and imagery are spelling strategies that have been found to be very effective at improving children's spellings. A description of each strategy will now be provided, along with a description of research supporting their effectiveness.

Phonology

Children's early attempts at spelling often reflect their current understanding of the internal structures of words (Read, 1971). Specifically, many young children try to analyze words into phonemes (units of sound) and use a letter or group of letters to represent each sound. The ability to recognize that a spoken word consists of a sequence of individual sounds is referred to as "phonemic awareness" (sometimes called phonological awareness, phonemic analysis, or phoneme segmentation; Ball & Blachman, 1991).

The realization that speech can be segmented into phonemes and that these phonemes can be represented by print has been found to be one of the critical, fundamental skills in the acquisition of reading and spelling (e.g., Ball & Blachman, 1991; Liberman, 1983; Tangel & Blachman, 1992). One manner in which children have been asked to demonstrate their phonological

awareness is by counting the sounds in words (telling how many sounds they hear in the word, "cat"), deleting sounds (say "sun" without the "s"), manipulating sounds, reversing phonemes, and categorizing sounds (categorizing words by the beginning, middle or ending sounds; Blachman, 1984, 1989; Wagner & Torgesen, 1987; Williams, 1980). Regardless of how phonological awareness has been measured, research indicates that phonological awareness is not only a good predictor of early reading and spelling success but that phonological awareness can be trained, with such training enhancing beginning reading and spelling achievement (Ball & Blachman, 1988, 1991; Blachman, 1991; Bradley, 1988; Bradley & Bryant, 1983, 1985; Cunningham, 1990; Juel, 1988; Juel, Griffith & Gough, 1986; Mann, 1984; Mann & Liberman, 1984; Mann, Tobin & Wilson, 1987; Stanovich, Cunningham & Cramer, 1984; Stanovich, 1986; Torneus, 1984).

In one of the earliest training studies, Elkonin (1973; as cited in Ball & Blachman, 1991) developed a technique to teach children to isolate and identify the individual sounds in words. Children were taught to say a word slowly and to move a small square tile as each sound in the word was pronounced. For example, as children said the word "rain," they might move a tile for the sound "r," one for the sound "ai" and one for

the sound "n." Children who were taught this method demonstrated greater sound analysis skills and showed noted improvement in various aspects of literacy relative to children who did not receive this training (Elkonin, 1973).

Bradley and Bryant (1983, 1985) conducted a large-scale training study in England using a simple, sound categorization task as the primary phoneme awareness training activity. In this activity, children were taught to categorize or group pictures together on the basis of shared sounds. For example, "hen" could be grouped with "men" and "pen" because they rhymed. In addition, the children were taught that "hen" could be grouped with "hat" and "hill" because they shared the initial sound; that "hen" could be grouped with "pin" and "sun" because they shared the end sound; and finally that "hen" could be grouped with "leg" and "net" because the middle sound was shared (Bradley & Bryant, 1985). Eventually the children learned to play a game called "the odd one out." Several picture cards depicting words that rhymed or that shared a sound in the initial, middle or final position would be placed on the table along with one picture that did not share this sound. The child was asked to identify the "odd one out" and to explain his or her choice.

To expand on this task, Bradley, and Bryant (1985)

had one of their experimental groups play the game "odd one out" using plastic letters to represent the shared sound (e.g., "p" to represent the shared sound in "pit" and "pear"). The other experimental group simply played the game "odd one out." Their results revealed that the children who were most successful on measures of reading and spelling were those who learned both to categorize words by their common sounds and to represent the sounds with plastic letters.

The question remains whether training in letter-sound associations without training in phonological awareness facilitate performance on reading and spelling tasks. Ball and Blachman (1988, 1991) investigated this question. In their study, they assigned 90 kindergarten children to either a treatment group or to one of two control groups. Children in the treatment group learned to segment one, two, and three-phoneme items and also learned letter sound associations. Children in the first control group engaged in a variety of language activities (e.g., listening to stories and general vocabulary development) and also learned letter sound associations by using the same letter sound stimuli as the phoneme awareness treatment group. The children in the phoneme awareness treatment group and the language activities control group met in groups of four or five, outside the regular classroom with specially trained

teachers for 15 to 20 minutes a day, four days a week, for seven weeks. The children in the third group received no intervention.

Before the treatment, the children in these groups did not differ in age, sex, Peabody Picture Vocabulary Test scores, phoneme segmentation ability, letter name knowledge, letter sound knowledge, and reading as measured by the Word Identification Subtest of the Woodcock Reading Mastery Tests. After the intervention, children were retested on phoneme segmentation, alphabet letter names and sounds, and the Woodcock Reading Mastery Word Identification Subtest. In addition, they were asked to read a list of 21 phonetically regular words and to spell a list of five words. As predicted, the children who participated in the treatment group significantly outperformed the children in both control groups in the phoneme segmentation, reading, and spelling tests.

From the results of this study, it is clear that increasing letter-sound knowledge in and of itself does not improve initial reading and spelling. On the other hand, phoneme awareness training coupled with instruction in letter sounds does have a positive effect on beginning reading and spelling.

Torneus (1984) explored other phonological training tasks and their effects on reading and spelling. In her

experiment, four different phonological tasks were used: sound segmentation, sound blending, position-analysis, and segment-deletion. In the sound segmentation task, children were instructed to segment words into their smallest parts (e.g., sounds) and to indicate each sound by putting a small plastic disk on the table for each sound as the sound was called. No feedback was given during the test, but the word was repeated if necessary.

In the sound blending task the sounds were presented at a rate of about one sound every three seconds. The children's task was to say the word that they would get if they blended the sounds together. In the position-analysis task, children first heard a word and then were asked which sound followed (or preceded) a given reference sound (e.g., police: Which sound comes after "o" in the word police?). The reference sound was always a vowel while most of the target sounds were consonants. In the segment-deletion task, children were asked to identify the deleted part of a word. (e.g., What have I taken away from the word "ask" when only "ak" is left?).

Reading was assessed by means of a silent reading test. The test included 400 isolated words. Each word was accompanied by four small pictures with the children's task to draw a line between the picture that best illustrated the target word. Spelling was assessed

by means of a dictation test consisting of 30 phonetically spelled common words.

Torneus (1984) found that sound blending and sound segmentation tasks correlated positively with reading and spelling measures. Children who received training in sound blending and sound segmenting out-performed children who received training in position analysis and sound-deletion on measures of both reading and spelling.

The results of these studies and others not reviewed here (e.g., Cunningham, 1990; Lundberg, Frost & Peterson, 1988), support the conclusion that providing systematic instruction in phonological awareness to kindergarten and first grade children can have a positive impact on beginning reading and spelling acquisition, especially when the instruction includes helping children make the connections between word sound segments and the letters representing those segments. Thus, helping children to become more aware of the sounds in words can improve their ability to sound out words and, therefore, be better spellers.

As children learn to read, they come to recognize an increasing number of words rapidly and automatically (Juola, Schadler, Chabot, & McCaughley, 1978). Because they frequently encounter these words (e.g., "looked"), children will begin to use them in their writings and spell them correctly (Drake & Ehri, 1984 as cited in

Woloshyn & Pressley, 1990). Teachers can provide children with a number of effective spelling strategies that can enhance children's spellings of these sight words and other related words. Exactly what strategies are effective can be discovered by looking at the strategies used by good and poor spellers.

Yee (1969 as cited in Woloshyn & Pressley, 1990) investigated young children's spellings performance and asked "good" and "poor" spellers how they spelled words. Good spellers reported that they relied on a variety of spelling strategies to spell hard words. One strategy involved breaking words into units and trying to visualize how these words look (e.g., imagery strategy). For example, one child remembered how she had written the word, "squirrel" on her pencil box. Good spellers also reported that they would use the spelling patterns to help them spell the unknown parts of words (analogy strategy). For example, one child spelled the word dinosaur as "dinosoar." Overall, poor spellers reported using fewer strategies than did good spellers. Poor spellers also used more phonetic strategies than did good spellers and did not make use of imagery techniques (Yee, 1969 as cited in Woloshyn & Pressley, 1990; Marino, 1980).

Good spellers have been found to use two strategies when attempting to spell hard words, imagery and

analogy. There is a great deal of research that supports the use of these two strategies in numerous areas of study including the instruction of spelling (Radaker, 1963; Englert, Hiebert and Stewart, 1985; Goswami & Bryant, 1990).

Imagery

Mental imagery - the process of visualizing an object or an event in one's mind - has been found to facilitate various types of learning (Woloshyn & Pressley, 1990). For instance, findings indicate that giving children instructions to use mental imagery, facilitates memory for test passages and other materials (Alesandrini, 1982). In one study, children remembered a passage better when they received imagery instructions when compared to a control group who used simple repetition, especially when the instructions were preceded by training in the use of this strategy (Kulhavy & Swenson, 1975). Imagery training has also been found to enhance the learning of prose. Lesgold, McCormick, and Golinkoff (1975) investigated the effectiveness of illustrating picturable facts associated with prose passages on the recall of these passages. It was assumed that training in an external pictorial strategy such as drawing would facilitate the learners' ability to use an internal pictorial strategy

such as visualization. Their results showed that children who received training in how to illustrate picturable facts remembered the prose passage better than those who did not receive training. Pressley (1976) found similar results. During a training session, third grade students either practiced making mental images and were shown examples of good pictures or practiced recalling story facts. Students who received imagery training were then instructed to form mental images after reading each passage of the target test. The imagery group remembered more about the passages than did the control students who received no imagery training and no imagery instructions (Pressley, 1977).

Imagery has also been used to enhance the learning of letter-sound associations (Ehri, Deffner & Wilce, 1984), recall of objects (Shepard, 1973), and recognition of words and pictures (Brown & Scott, 1971; Hoffman & Dick, 1976; Dirks & Neisser, 1977). In addition, the use of imagery has been found to improve the acquisition of spelling skills (Radaker, 1963; Sears & Johnson, 1986; Graham & Miller, 1979).

Radaker (1963) was among the first investigators to establish the groundwork for the use of mental imagery in spelling. Radaker trained sixty fourth grade children to use an imagery strategy when studying

spelling words. Training sessions involved having the children first visualize the target word in their minds. Second, they were to imagine the word displayed on a large outdoor screen. Third, they were to imagine pasting each letter of the word onto the screen. Finally, they were to help themselves remember the word by imagining a floodlight luminating the word until the image faded from their mind. Radaker (1963) had two training groups, one which was given two 45-minute training sessions and another which was given six 45-minute sessions. Training was completed within a two-week block.

When compared to children who did not receive mental imagery instruction, Radaker (1963) found that children who were instructed to use mental imagery demonstrated superior spelling performances on spelling tests (e.g., Stanford Achievement Test, Form N). Also, performance scores were equal for both training groups revealing that only a few training sessions were required to teach the mental imagery strategy adequately. In addition, imagery-trained students continued to demonstrate superior spelling performance one year after training (Radaker, 1963). Findings like these and from other researchers (e.g., Fitzgerald, 1951; Gilstrap, 1962; Horn, 1926, as cited in Woloshyn & Pressley, 1990; Graham & Miller, 1979) support the use

of mental imagery as a tool to facilitate spelling performance.

The research reviewed thus far, provides evidence for the value of instructing children to use mental imagery when learning new material. It appears that the construction of an integrated mental image leads to substantial and reliable improvements in the ability to remember and spell words. Children's memory and recall of correct spellings of words have also been enhanced by another strategy, analogy.

Analogy

The general rationale behind the analogy strategy is that the identification and use of known orthographic patterns will aid children in their attempts to spell unknown words (Woloshyn & Pressley, 1990). Suppose that a child can spell the word "light" and has been asked to spell the word, "fight." She/he could recognize that the word to be spelled ends with the same sound as "light" (e.g., "ight)" and could use the same pattern of letters from "light" to spell "fight." Thus, knowing how to spell "light" can help the child to spell the word "fight," just as knowing the word "beak" can help the child to spell the word "weak."

It should be noted that the familiar and unfamiliar words in these examples are rhyming words. According to

Goswami and Bryant (1990) the ease with which young children rhyme and detect rhyme and alliteration is a good reason for instructing children to use analogy when reading and spelling new words. When children rhyme they are in effect putting words into categories: These are categories of words with the same end sounds (Goswami & Bryant, 1990). When children become skilled at recognizing rhyme and putting words into rhyming categories, they will quickly discover that words which sound the same are generally spelled the same (Englert, Hiebert, & Stewart, 1985; Goswami & Bryant, 1990). Once children have recognized the connection between rhyme and spelling patterns, they are in a position to use rhyme to make inferences about reading and spelling unfamiliar words (Goswami & Bryant, 1990).

Baron (1977) examined kindergarten and Grade One students' use of analogy in the reading of unknown words. In the first stage of his study, children were taught words and sounds like "b," "at," "bat," "ed," and "red." In the second part of the experiment they were given words of two types. One set of words could be read by analogy. "Bed" and "rat" are two examples of this kind of word: "bed" ends in the same way as "red," and "rat" as "mat." The children would only be able to read the other type of words, according to Baron, with the help of grapheme-phoneme rules. "Bad" and "bet" are

example of such words. They do not share the same spelling sequences with the original words and, therefore, cannot be deciphered by analogy.

The results were very striking. There was a significant difference between the two conditions, favouring those children who had received training in the use of analogy. The children were able to read around 90% of the first kind of word (words that could be read by analogy). Yet they only managed to read 15% of the words for which analogies were not possible. Baron (1977) concluded that young children use analogies spontaneously and naturally even at the beginning stages of reading, and that they take to this strategy much more willingly than to using grapheme-phoneme correspondences.

According to Goswami and Bryant (1990) analogies are used for words that share sounds and are therefore based on sounds (phonology). According to the developmental stages of spelling, phonology plays a very important role in children's spelling. If children make analogies about phonological units when they read unfamiliar words, they will probably also do so when they try to spell a word for the first time (Goswami & Bryant, 1990).

Evidence that children are aware of orthographic patterns and use them to spell words is obtained through

children's invented spellings. Henderson and Templeton (1986), in their description of the third developmental stage of spelling, the "within-word pattern" stage, noted that children begin to recognize similar orthographic patterns between known and unknown words and to think of spelling as matching patterns of letters in relation to sound, rather than single letters matching sounds. Several other studies have also provided evidence that children use analogy to spell unknown words (Campbell, 1985; Marsh, Friedman, Welch & Desberg, 1980; Marsh, Friedman, Desberg & Saterdahl, 1981; Goswami, 1988).

Goswami (1988) investigated the use of "clue words" to study analogies in spelling. She worked with a group of six-year-old children and pretested their spelling of target words. The main experiment followed a few days later. In each trial in the experiment, the child was shown a "clue" word, such as "beak," and was told what it said. This word was left on the table while the experimenter asked the child to spell some other words. Some of the words sounded similar to the clue word ("bean," "peak"), and others did not ("lake," "bask"). It was assumed that if children make analogies in spelling, they should be able to use "beak" as a basis for spelling "bean" and "peak," but not "lake" and "bask." Goswami (1988) found that children spelled the

analogy words better than the control words. Therefore children appear to be able to use analogies in spelling as well as in reading.

Several other studies have also investigated the effectiveness of analogy training on reading and spelling (e.g., Cunningham, 1979; Guthrie & Cunningham, 1982; Cunningham, 1990). In one study examining reading by analogy, Cunningham (1979) trained educable mentally challenged and learning-disabled youngsters to use familiar parts of known words as a base for pronouncing two-syllable words. The significant improvements in reading a set of transfer words was viewed as evidence that such children could learn a strategy for analyzing unfamiliar words by contrasting unknown words with known words.

In another study, Englert, Hiebert and Stewart (1985) found similar results when they trained mildly-challenged children to use analogy strategies. In the first phase of analogy training, children learned and memorized the "rhyming rule." Children learned that when two words rhyme, they often share the same spellings. Examples of this rule were provided along with opportunities for children to identify rhyming words from a list of words. Children also identified the letters that the two words share according to the rhyming rule.

In the next phase, children were introduced to two or three target words. In teaching these words, children were instructed to first spell the word aloud from memory and then write the word from memory two times. This was repeated until the spelling was correct. Children then found words that rhymed with the target word and identified the portions in both words that rhymed, whereafter, they spelled new words using the rhyming elements of the target word.

Finally, children expanded on their word analysis skills. Children read the lists of practice transfer words that were generated earlier. In addition, children were presented with cloze sentences that contained deleted practice transfer words. Children were asked to write these transfer words without looking at the spelling of target words. If the transfer word was not spelled correctly, the children were given a verbal prompt to think of words that rhyme with that transfer word and how they were spelled. If this was insufficient, children were given back their list of target words to search for the word that rhymed with the transfer word. Thus, the primary emphasis of this portion of training sessions was to focus on searching for orthographic similarities between known and unknown words and to use these shared spelling patterns to spell new words (Englert et al., 1985).

The results of this study revealed that instruction in spelling common and uncommon practice words enhanced the spelling performance of mildly challanged students. The spelling instruction had strong positive effects on students' abilities to spell noninstructed words based on the analogy strategy. When taught a core of spelling bank words and provided practice in spelling new words, experimental subjects were more likely to generalize their knowledge of orthographic patterns to spell new words than control subjects. Without such training, control subjects could spell more words but showed little transference of orthographic knowledge to spell new words.

Active word study and the extraction of familiar word patterns to spell unfamiliar words has been found to increase children's orthographic knowledge of spelling. Analogy, therefore, is a useful tool for young spellers. Teachers who are aware of this strategy can enhance their children's learning by training them to look for patterns in words and to use these patterns to spell new words.

Three very effective spelling strategies have now been reviewed: phonology, imagery, and analogy. Each has been found to play an important role in children's ability to spell. Training in the use of any one of these strategies alone, has resulted in significant

spelling improvement. However, studies have revealed that good strategy users know and can execute a variety of strategies that accomplish many specific cognitive goals (Pressley, Borkowski & Johnson, 1988). In addition, good spellers report that they rely on a variety of spelling strategies when attempting to spell hard words (Yee, 1969 as cited in Woloshyn & Pressley, 1990). Thus, an effective spelling program should include instruction in multiple spelling strategies (phonology, imagery and analogy). An investigation into the effectiveness of training Grade One students on these three strategies versus traditional spelling instruction is one of the aims of this study.

In addition to investigating the effectiveness of training in phonology, analogy and imagery, the effectiveness of two different types of instruction (explicit versus implicit) will also be examined. Briefly, explicit instruction involves training children in the use of various strategies and making children more metacognitively aware of how, when, where and why to use strategies. Implicit instruction simply involves training children in the use of various strategies. According to Pressley et al. (1988), appropriate use of strategies can occur only when learners possess detailed knowledge about how, when, and where to use strategies.

Metacognition

Metacognition is the knowledge and control children have over their own thinking and learning activities (Cross & Paris, 1988; Flavell, 1977; Paris & Winograd, 1990). There are two essential features in metacognition, self-appraisal and self-management. These two aspects of metacognition will be discussed briefly followed by a review of the research on metacognition and learning.

Self-appraisal includes personal reflections about one's knowledge and abilities. According to Flavell (1977), they are judgements about one's personal cognitive abilities which can impede or facilitate performance on cognitive tasks. Basically, self-appraisal includes what one knows (declarative knowledge), how one thinks (procedural knowledge), and when and why to apply strategies (conditional knowledge) (Paris, Lipson & Wilson, 1983; Paris & Lindauer, 1982).

Self-management reflects the plans children make before they engage in a task, the adjustments they make as they work, and the revisions they make after they complete the task (Paris & Winograd, 1990). Children's thoughts are guided by their ability to form good plans, use a variety of strategies, and monitor and revise their performance. Paris and Lindauer (1982) refer to these actions as evaluating, planning and regulating.

In summary, metacognition is a complex array of knowledge and skills that includes knowing what a strategy is, how to carry it out, and knowing when and why to use a particular strategy (Cross & Paris, 1988). It also includes the skills required to select and monitor the success of chosen strategies.

Efficient learning is characterized by appropriate use of strategies, with sophisticated metacognition being a necessary component of efficient strategy use (Pressley, Borkowski & Schneider, 1987; Kurtz, 1990). Numerous studies have documented the relationship between metacognitive awareness and strategic behaviour (Kurtz, 1990; Pressley, Borowski & Schneider, 1987). Instructional programs that provide children with metacognitive information about strategies have also been found to improve children's performances on various cognitive measures, including performance on memory tasks (Schneider, 1985), school achievement (Pressley, Borkowski & O'Sullivan, 1985; Schneider, 1985), early reading skills (Evans, Taylor & Blum, 1979) and reading comprehension (Cross & Paris, 1988; Kurtz, 1990; Paris & Lindaurer, 1982).

In a classroom-based project, Paris, Cross and Lipson (1984) instructed third and fifth grade children about the existence and use of reading strategies through an Informed Strategies for Learning (ISL)

program. Through this program, children in the treatment group received comprehension instruction designed to stimulate greater awareness of declarative, procedural, and conditional knowledge (specific strategy knowledge), while also receiving instruction in how to evaluate, plan, and regulate their own comprehension (strategy regulation). Children in the control group completed traditional comprehension questions following the reading of selected texts. Results from the ISL program showed significant correlations between comprehension and reading awareness for both third and fifth grade children. Furthermore, comparisons between experimental and control groups revealed that children in the experimental groups gained significantly more from pretest to posttest on measures of reading awareness and strategic reading. Hence, instruction that included strategy training and metacognitive awareness training led to significant improvements in third and fifth grade children's reading skills.

Another study investigated children's use of repair strategies as they read (Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, Vavrus, Wesselman, Putnam, & Bassiri, 1987). Duffy et al. (1987) hypothesized that children (Grades 3 and 5) who were poor readers and received explicit explanations about repair strategies (declarative knowledge), when to use them (conditional

knowledge) and how to use them (procedural knowledge) would demonstrate higher levels of metacognitive awareness about instruction and, ultimately, possess higher levels of reading achievement than those who did not receive such explanations. Teachers were trained to restructure prescribed basal reading textbook skills as repair strategies and to explicitly explain these strategies. Explanations began with discussions about the text and explicit introductory statements about when the repair strategy would be used in the text. Next, teachers modeled the reasoning used when employing the strategy followed by guided student practice. Teachers then discussed the application of these strategies while reading the text. Control teachers followed traditional basal reading textbook procedures emphasizing routine skills rather than strategies, and drill and practice rather than explicit explanations. Results of the study revealed that low aptitude children who received explicit strategy instruction demonstrated more metacognitive awareness of repair strategies and the need to employ them than did high aptitude children who received the same instruction. In addition, explicit instruction students demonstrated greater achievement on a variety of traditional and nontraditional reading achievement measures than students who received traditional instruction.

Metacognitive training has also improved the effectiveness of phonological instruction. Cunningham (1990) examined "implicit" versus "explicit" phoneme awareness instruction in kindergarten children. In both the implicit and explicit experimental groups, children received training in both phoneme segmentation and blending. Children in both groups were introduced to a skill (e.g., the concept of analysis--that language is comprised of sounds that can be broken down into component parts), and were shown how the skill should be applied in a reading situation with examples. The utility of the skill for reading activities was then demonstrated and practiced. The teacher then modeled the skill in a hypothetical reading context, after which the child had an opportunity to perform the skill. The feedback the child received was explicit and corrective in nature. The core of the two instructional programs (explicit versus implicit) was identical. They differed, however, with regard to the emphasis placed on the relation between phonemic awareness and reading. In the implicit group, only segmentation and blending were taught. In the explicit program, however, children were further directed to reflect upon their own thinking regarding phonemic awareness and participated in discussions about the goals and purposes of learning phonemic awareness.

In summary, the explicit program provided a metacognitive knowledge that was missing in the skill and drill program (implicit). In the control group, children listened to a story and answered a series of questions about each story. Results of this study revealed that children in the explicit group outperformed children in the implicit and control groups on measures of reading achievement. That is, children who reflected upon and discussed the value, application, and utility of phonemic awareness for the activity of reading at an explicit level performed significantly better on a transfer measure of reading achievement than the skill and drill experimental group (Cunningham, 1990).

The studies presented thus far reveal that instructional programs which include metacognitive information about strategies, and especially direct instruction about how to monitor strategy effectiveness, are very effective at enhancing various areas of children's learning. Providing children with direct explanations about strategies and how they can be applied in their learning appears to result in significantly greater learning achievement. Thus, a spelling program that provides children with a variety of effective spelling strategies along with direct instruction in the application of these strategies would

result in improved spelling behaviour.

Programs which provide strategy instruction through direct instruction have been found to focus their explanations around five key features (Winograd & Hare, 1988). To begin, explanations are provided about what the strategy is by describing the critical features of that strategy. An explanation of why the strategy should be learned (purpose and benefits) is then presented. Each step in the strategy is then explained as clearly as possible (how to use the strategy). Guidelines of appropriate circumstances under which the strategy could be employed (when and where to use the strategy) are then provided. Finally, explanations of how to evaluate the use of the strategy is provided (Winograd & Hare, 1988). By focusing explanations around these five key features, procedural and declarative knowledge about strategies (self-appraisal) can be provided along with knowledge on how to evaluate, plan, and regulate these strategies (self-management). Therefore, direct explanations can enhance children's metacognitive knowledge about strategies, and make them more effective and efficient strategy users.

Summary

To conclude, three effective spelling strategies have been presented: phonology, imagery and analogy.

Training in any one of these strategies has resulted in significant improvements in spelling performance. Therefore, one could predict that training in all three of these strategies would result in greater improvements in spelling performance. In addition, previous studies have revealed that explicit instruction enhances strategy learning and makes children more efficient and effective strategy users. Researchers have enhanced children's metacognition and learning by directly explaining to children what strategies are, why they should use them, how they should use them and when and where to apply these strategies. One could thus predict that providing children with direct explanations in the use of the three spelling strategies (phonology, imagery, and analogy) would result in improved spelling performance and children being more metacognitively aware of the effectiveness of these three spelling strategies than providing them with implicit or traditional instruction.

CHAPTER THREE: METHODOLOGY

Introduction

This chapter outlines the procedures followed to investigate the effectiveness of two spelling strategy programs versus a traditional spelling program on young children's invented spellings. Characteristics of the sample involved in this study are provided, along with a detailed description of the various assessment instruments used. In addition, an outline of each training program is presented, followed by a discussion of the limitations involved in carrying out this investigation.

Subjects

Thirty-five children were selected from two Grade One classrooms at one school in Burlington, Ontario, in the Halton Public Board of Education (15 males, 20 females; mean age = 6.7 years; standard deviation = 0.05). All parents provided written consent for their child to participate in this study (See Appendix A). Two E.S.L. (English as a Second Language) students participated in the training sessions. However, due to their limited language skills, their scores were not included. One subject was lost to the study due to moving. Another subject was removed from the study due to an inability to remain on task during training sessions, causing interference for other group members. Subjects were

randomly assigned to one of three groups: implicit-strategy instruction, explicit-strategy instruction, or traditional language arts activities (control).

Materials Used for Assessment

Developmental Spelling Test

The Developmental Spelling Test (designed by Tangel & Blachman, 1990), was used to measure children's levels of spelling. This test is sensitive to the developmental movement of children's spelling as outlined by Read (1971, 1986). Specifically, children are asked to spell five words (lap, sick, elephant, pretty, train) selected to represent the early developmental spelling patterns noted by Read (1971, 1986), including the spelling of short vowels (lap, sick), the representation of preconsonantal nasals and the representation of "shwa" (elephant), representation of the intervocalic tap (t) between two vowels (pretty), the representation of the "tr" blend (train), and the spelling of long vowels (train). The children's spellings of these five words are given a score between 0 and 6, where 0 equals a random string of letters; 1 equals a single letter that represents some salient part of the word other than the initial phoneme; 2 equals the correct initial phoneme of the word; 3 equals one or two letters from the initial syllable along with two

phonemes from some salient part of the word; 4 equals the initial phoneme represented, along with an appropriate vowel; 5 equals all initial phonemes, along with an appropriate vowel and representation of the final phoneme(s); 6 equals the correct spelling. The target words and scoring sheet are listed in Appendix B. Inter-rater reliability for the scoring system was reported at $r = .99$, $p<.01$. Also, reliability for individual words was $r = .98$, $p<.0001$.

Dictated Spelling Test

This is a 20-item test consisting of 15 target spelling words that were used in the training sessions, along with five transfer words. The transfer words rhymed with target words and differed only in the beginning letter (e.g., target word = "cat," transfer word = "rat"). Transfer words were included to see if children could apply the training strategies when spelling an unknown word. For example, children could use the rhyming principle from the analogy strategy to realize that "cat" and "rat" rhyme and should therefore share the same spelling pattern. They could also remember how to spell "cat" through the use of imagery, and then spell "rat" by "sounding out" the first sound, "rrr" and representing it with the letter "r." The Dictated Spelling Test is listed in Appendix C. To be

sensitive to the developmental movement of children's spelling, words were given a score from 0 - 5 according to their approximations to the correct spellings, using a similar scoring scheme as with the Developmental Spelling Test. The scoring system for the Dictated Spelling Test is listed in Appendix C.

Samples of Writings

Samples of children's classroom writings were also collected. One sample of writing from each subject was collected prior to the start of the experiment (January, 1993). Each child was given a sheet of paper on which the top half of the page was blank and the bottom half contained four lines. Children were provided one half hour to write on any topic. The children were told that they could not talk to anyone including the instructor, or receive help from anyone to spell a word. The children were also told that they had to write enough to fill the page (four lines). The proportion of correctly spelled words was compared to the proportion of incorrectly spelled words (invented spellings) for each student. The same sample of writing was dictated back to each student at the end of the experiment. The same scoring criterion was used to asses the second piece of writing.

In addition, a qualitative analysis was done on

each sample of writing. The standard (correct) spellings for each sample writing were written on a separate piece of paper, in a long column. (See Appendix D). Next to the standard spelling, in the second column, the child's first attempt at spelling the word (at pretest) was recorded. In the third column, the child's second attempt (at immediate posttest) was recorded. Changes in spelling attempts were then noted for each sample writing and across experimental conditions.

Test of Metacognition

At the end of the training session, each child was asked to elaborate on what was happening in his/her mind when he/she was asked to spell words. Specifically, the children were asked, "What do you do if you don't know how to spell a word?" If necessary, children were given an example word and asked, "What do you do if you don't know how to spell the word, `man'?" (a target word) Children's responses were scored as to whether they mentioned one or more of the training strategies. One point was given for each strategy mentioned that was used in this study. No point was given if children mentioned any other effective strategy (e.g., "I ask my mother/teacher how to spell it"). The following responses each received one point: sounding the word out

or writing it like it sounds (phonology); thinking about what the word looks like or writing it like it looks (imagery); or thinking of a word that they know how to spell that rhymes with the target word (analogy). The Metacognitive spelling test is listed in Appendix E.

Target and Transfer Words

Training words were taken from Lessons 13 and 15 of the spelling series, "Life Design Spelling: Grade One" (1991). Lessons 13 and 15 were chosen because they were the first lessons where whole words were introduced for spelling (e.g., Lessons one to twelve introduced and reviewed various consonant sounds). Lesson 13 also corresponded with regular classroom spelling instruction. In addition, using target words from a recently published series insured that the words chosen were age appropriate for the subjects in this study.

Procedure

In January of 1993, all children were administered the developmental spelling test and the dictated spelling test. All tests were administered to the whole class. Samples of children's writings were also collected at this time.

Children in the traditional, implicit and explicit spelling groups met in small groups of four or five

students for 25 minutes, over a four-week interval. Therefore, each group had four sessions. Ten target spelling words were presented in the first and third sessions. Children completed activities based on these words for two sessions. Therefore, activities on the first 10 words were completed over the first and second sessions and activities on the second set of 10 words were completed over the third and fourth sessions.

Traditional Spelling Instruction

Children in the traditional spelling activities group (control condition) received spelling instruction taken from the spelling program, "Spelling; Grade One" (1990) Lesson 13 and Lesson 15. In this program children were required to write out the target words two times, find rhyming words (e.g., find two words from the spelling list that rhyme with "pan"), complete closure activities (My ____ (ran/cat) drinks milk), write sentences using the target words, and find target words among chains of letters (e.g., vbedr; Lesson Plans outlined in Appendix F).

Implicit Strategy Instruction

Children in the Implicit Spelling Strategy group and the Explicit Spelling Strategy group participated in activities based on three spelling strategies:

1) "sounding out" or phonology, 2) imagery, and 3) analogy. Lesson plans for the implicit strategy instruction group are outlined in Appendix G. These lesson plans provided the instructor with a script to follow to minimize any differences in instruction across the experimental conditions.

Phonology Training

Children in the implicit and explicit groups participated in activities in which they had to segment words into their individual phonemes and represent these phonemes with the correct alphabet letter. This instruction was adapted from a training program used by Elkonin (1973) and Ball and Blachman (1991). Children were told to say each phoneme in the target word and to simultaneously move a disk to represent each phoneme. For example, for the word "it," the instructor pronounced the word "it," placed her finger on the "i" disk, moved the disk down from a group of disks onto a drawn line saying "iiii" in a drawn out fashion. The instructor then repeated this procedure with the "t" disk. The target word was then repeated in its original blended form while the instructor ran her finger across the word. After observing the correct model, the children were cued that it was now their turn to repeat the procedure. This segmentation task was then repeated

using letter disks on which the appropriate letters were displayed. The same procedure was repeated with each target word.

Imagery training

This training was adapted from a program outlined by Radaker (1963). Children were presented with target words which were printed on individual flash cards. These flash cards were presented one at a time with the children instructed to read each word carefully, paying close attention to the order of the letters in the word (e.g., "Look at the word `bed'; there is a `b', an `e', and a `d'"). Next, the children were instructed to close their eyes and imagine that they were at a movie theater where there was a large movie screen. They were instructed to imagine that they were painting the target word on the screen, one letter at a time, using paint (e.g., "Dip your paint brushes into your paint cans. Now let's paint a large `b'," etc.). The children were then told that the paint was magic and was starting to make their letters get bigger and bigger. Next, the children were instructed to take a picture of their word using their pretend cameras to show their friends what they had done. The picture was to then be placed into their imaginary photo albums. Children were then told to imagine that they were looking at their word on the

movie screen again. The magic paint was still making their word get larger. The children were instructed to imagine their word getting larger until it burst. Each child was then asked how to spell that particular word, (e.g., "bed").

Analogy Training

These training sessions were adapted from the analogy training sessions used by Englert, Hiebert and Stewart (1985). To begin instructing children in the use of the analogy strategy, children were taught that when two words rhyme, the last part of the words are often spelled the same. Demonstrations using the target words were provided for this rule and children were made to memorize this rule (e.g., children were shown target words, "man," "ran" and "can" and asked what was the same about them). Children usually responded that they rhymed. They were then asked if they noticed anything else that was the same about these three words. They usually noticed that these words shared the same spellings. Children were instructed in this rule until they could indicate which two words from one list rhymed and could indicate which letters the words shared according to the rhyming rule.

Once children had been presented a target word through the imagery exercises (e.g., "man"), they were

asked to find words from a presented group of words that rhymed with the target word (e.g., "ran" and "can"). Children were also be asked to identify the letters in both words that were spelled the same (e.g., "an"). They were then encouraged to spell the transfer words based on the rhyming elements of the target word (e.g., "pan" "tan" "Dan").

Explicit Strategy Instruction

In addition to strategy instruction, children in the explicit strategy group participated in discussions about these strategies. These discussions focused on the importance and application of these strategies according to five criteria. Specifically, the critical features of each strategy were discussed (e.g., "Can someone tell what strategy we just learned and how it works?"), as well as, why the strategy should be learned, how to use the strategy, when and where to use the strategy, and how to evaluate the effectiveness of the strategy (e.g., "Can someone tell me when we could use this strategy?" "Why do you think this strategy is important to know?" "Can we use this strategy on any word?") Lesson plans are outlined in Appendix H. These lessons provided the instructor with a script to follow in order to minimize any differences across experimental conditions.

Data Analysis

Once the data were collected, the pretest and posttest performance scores were compared to determine whether a significant difference existed between children who received traditional spelling instruction, implicit strategy instruction, or explicit strategy instruction. For each dependent measure, the Dunn-Bonferroni procedure (Kirk, 1982) was used to compare the performance scores of the two strategy instruction groups (implicit versus explicit). The Dunnett procedure (Kirk, 1982) was then used to compare the performance scores of each strategy instruction group to the performance scores of the traditional spelling group (control).

Limitations

As with all studies, there were several weaknesses in this present study. The sample size was small (n=35). Therefore, the conclusions obtained from this study may not be generalized beyond this specific population. In addition, the sample is representative of a middle-class neighbourhood. What is also interesting to note is that the children in these two Grade One classrooms may not be representative of other Grade One classes in the area. The French Immersion program at the school involved in the study tends to

attract higher academic students from kindergarten. In addition, the remaining higher academic students were placed in a Grade One/Two class created the year of the study.

All testing and training programs used in this study were conducted by the experimenter, creating the possibility of experimenter bias. In addition, the results of this study may have been affected by a motivational factor in that the children may have perceived the implicit and explicit training activities as being more exciting than the traditional language arts activities.

Another limitation of this study was that it was unable to pinpoint what particular strategy was effective. The results only revealed whether or not the strategies, together, were effective. However, this was not the intent of the study as previous studies have revealed that each strategy on its own was effective at improving children's spelling skills.

The age of the children involved in this study may have been another limitation. The children may not have been developmentally ready to gain from strategy instruction. The majority of studies investigating strategy instruction were performed with older students.

Summary

Children participated in activities in which they had to segment words into their constituent sounds, categorize them according to similar beginning or ending sounds (to help them sound out words better), create and spell new words through rhyme (analogy) and develop mental pictures of words in their minds (imagery). The target spelling words were the same for all three spelling groups and were taken from the program, Spelling (1991) (Lesson plans outlined in Appendix F).

After training, children were again administered the dictated spelling test and the developmental spelling test. In addition, children were given a metacognitive test in which they were asked questions about their spellings. The dictated and developmental spelling tests were re-administered two weeks following the training sessions.

CHAPTER FOUR: FINDINGS

Introduction

The children in this study were tested on three occasions: 1) prior to spelling strategy training, in January, 1993, 2) at the completion of the four-week training program, and 3) two weeks following training. There were 13 children in the traditional language activity group (control), 11 in the implicit strategy group and 11 in the explicit strategy group. At each testing session, children were required to complete a Dictated Spelling Test and a Developmental Spelling Test. A sample of writing was also collected. At the completion of the training session, children completed a metacognitive spelling test.

Performance scores from the pretest, immediate and 14-day posttest measures were compared to determine if a significant difference existed between the children who received traditional spelling instruction, implicit strategy instruction or explicit strategy instruction. The same comparisons were made for the pretest-posttest change scores (i.e., pretest to immediate posttest and pretest to 14-day posttest).

Findings from the three testing sessions will be presented in this chapter. Results from the Dictated Spelling Test will be presented first, followed by the findings from the Developmental Spelling Test. A quantitative and qualitative analysis of the sample

writings will then be presented, followed by the findings from the metacognitive spelling test.

Analysis of Students' Pretest Performance Scores

Dictated Spelling Test Pretest Scores

The dictated spelling test measured children's ability to spell the target words used in training. Subjects could receive a possible score of 20 on this test. See Table 2 for pretest means and standard deviations as a function of experimental condition.

Explicit and implicit strategy instruction students' pretest performance scores for the Dictated Spelling Test were compared using the Dunn-Bonferroni procedure (Kirk, 1982). The critical value was $t(32) = 2.36$. No significant difference was found between the pretest performance scores of students in the explicit and implicit strategy instruction groups prior to training ($t[32] = 0.35$, MSe = 11.99, $p>.05$).

Explicit and implicit instruction students' pretest performance scores on the Dictated Spelling Pretest were compared to the traditional spelling students' pretest performance scores using the Dunnett procedure (Kirk, 1982). The critical value was $t(32) = 1.99$. No significant differences existed between the pretest performance scores of students in the explicit-

Table 2

Means and Standard Deviations for all Pretest Measures as a Function of Experimental Condition

	Explicit		Implicit		Traditional	
Test	M	S.D.	M	S.D.	M	S.D.
Dictated Spelling Test	4.00	3.38	4.36	3.64	3.54	3.38
Dictated Spelling Test Scored Developmentally	51.36	18.41	54.91	23.01	46.23	23.00
Developmental Spelling Test	15.73	2.83	15.00	4.67	13.31	5.54
Percentage of Correctly Spelled Words Sample Writings	31.18	11.15	28.00	19.27	26.62	19.68

instruction group and the pretest performance scores of students in the traditional-spelling group (t[32] =0.46, MSe =11.99, p>.05). In addition, no significant difference was found between the pretest performance scores of students in the implicit instruction group and the pretest performance scores of students in the traditional spelling group (t[32] =0.82, MSe =11.99, p>.05).

Pretest Performance on Dictated Spelling Test Scored Developmentally

In order to capture the developmental nature of children's spellings, the dictated spelling test was scored again with children receiving a score based on their approximations to the "standard" spellings of the dictated words. Subjects could received a possible score of 100. See Table 2 for pretest means and standard deviations as a function of experimental condition.

Explicit and implicit strategy instruction students' pretest performance scores on the Dictated Spelling Test Scored Developmentally were compared using the Dunn-Bonferroni procedure. The critical value was t(32) = 2.36. No significant difference existed between the pretest performance scores of students in the explicit strategy group and the pretest performance

scores of students in the implicit strategy group (t[32] = 0.54, MSe = 468.99, p> .05).

Explicit and implicit strategy instruction students' pretest performance scores were compared to the traditional spelling students' pretest performance scores using the Dunnett procedure. The critical value was t(32) = 1.99. No significant difference existed between the pretest performance scores of students in the explicit strategy group and the pretest performance scores of students in the traditional spelling group (t[32] = 0.82, MSe = 468.99, p>.05). In addition, no significant difference existed between the pretest performance scores of students in the implicit strategy group and the pretest performance scores of students in the traditional spelling group (t[32] = 1.38, MSe = 468.99, p> .05).

Pretest Performance on the Developmental Spelling Test

The Developmental Spelling Test (DST) (Tangel & Blachman, 1990) consisted of five words. Each word targeted a specific characteristic of early writings (e.g., "train" targeted the natural spelling of the blend "tr" with "chr"; "lap" targeted the spelling of the short "a" sound). Subjects could receive a maximum score of 30. See Table 2 for pretest means and standard deviations.

Explicit and implicit strategy students' pretest performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the pretest performance scores of students in either the implicit or explicit instruction groups on the Developmental Spelling Test ($t[32] = 0.373$, MSe = 20.84, $p>.05$).

Explicit and implicit instruction students' pretest performance scores on the Developmental Spelling Test were compared to the pretest performance scores of students in the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference existed between the pretest performances of students in the explicit strategy group and the pretest performance scores of students in the traditional spelling group ($t[32] = 1.29$, MSe =20.83, $p>.05$). In addition, no significant difference existed between the pretest performance scores of students in the implicit strategy instruction group and the pretest performance scores of students in the traditional spelling group ($t[32] = 0.91$, MSe =20.84, $p>.05$).

Pretest Performance for Sample Writings

Prior to the training sessions, subjects were asked to produce a four-lined sample of writing. The writing

samples were scored according to the number of correctly spelled words to incorrectly spelled ones. Subjects could receive a possible percentage score of 100. See Table 2 for pretest means and standard deviations for the proportion of correct to incorrectly spelled words as a function of experimental condition.

Explicit and implicit strategy instruction students' pretest performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the pretest performance scores of students in the explicit strategy group and the pretest performance scores of students in the implicit strategy group ($t[32] = 0.45$, $MSe = 300.15$, $p>.05$).

Explicit and implicit strategy instruction students' pretest performance scores were compared to the pretest performance scores of students in the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference existed between the pretest performance scores of students in the explicit strategy instruction group and the pretest performance scores of students in the traditional spelling group ($t[32] = 0.62$, $MSe = 300.15$, $p>.05$). In addition, no significant difference existed between the pretest performance scores of students in the implicit strategy instruction

group and the pretest performance scores of students in the traditional spelling group ($t[32] = 0.20$, $MSe = 300.15$, $p>.05$).

Immediate and 14-Day Dictated Spelling Test Performances

Table 3 displays the means and standard deviations of the pretest, immediate and 14-day posttest performance scores for each spelling condition. Descriptively, subjects in each condition made gains in performance from pretest to immediate posttest, with students in the explicit strategy instruction group making the greatest gains in performance. Furthermore, they retained these gains at 14-day follow up.

Explicit and implicit strategy instruction students' performance scores on the immediate posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference was found between the performances of students in the explicit and implicit strategy instruction groups ($t[32] = 1.59$, $MSe = 20.02$, $p >.05$).

Explicit and implicit strategy instruction students' performances scores were compared to the performance scores of students in the traditional spelling (control) group using the Dunnett procedure. The critical value was $t(32) = 1.99$. The explicit

Table 3

Means and Standard Deviations for the Dictated Spelling Test for Pretest, Immediate and 14-Day Posttest as a Function of Experimental Condition

	Pretest		Immediate Posttest		14-Day Posttest	
Condition	M	S.D.	M	S.D.	M	S.D.
Explicit Strategy Instruction	4.00	3.37	12.27	2.90	13.00	2.60
Implicit Strategy Instruction	4.36	3.64	9.36	3.74	7.72	4.31
Traditional Instruction	3.53	3.38	8.00	5.88	7.23	4.91

strategy group significantly outperformed the traditional spelling group ($t[32] = 2.33$, $MSe = 20.0$, $p < .05$). There was no significant difference between the performance scores of students in the implicit strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.72$, $MSe = 20.02$, $p > .05$).

Explicit and implicit strategy instruction students' performance scores from the 14-day posttest were compared using the Dunn-Bonferroni procedure. The cutoff value was $t(32) = 2.36$. The explicit strategy group significantly outperformed the implicit strategy group ($t[32] = 2.99$, $MSe = 17.02$, $p < .05$).

Explicit and implicit strategy instruction students' performance scores on the 14-day posttest were compared to the traditional spelling group using the Dunnette procedure. The critical value was $t(32) = 1.99$. The explicit strategy group significantly outperformed the traditional spelling group ($t[32] = 3.41$, $MSe = 17.02$, $p < .05$). However, no significant difference existed between the performance scores of students in the implicit strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.29$, $MSe = 17.02$, $p > .05$).

Immediate and 14-Day Dictated Spelling Test Performance Scores When Scored Developmentally

Table 4 displays the Dictated Spelling Test means and standard deviations as a function of experimental condition. For all three spelling groups, descriptive gains in the performance scores can be readily noted across time. Furthermore, gains were maintained 14 days after training. Descriptively the explicit strategy group made the greatest gain in performance, followed by the implicit strategy group which, in turn, made greater gains in performance than the traditional spelling group.

Explicit and implicit strategy instruction students' performance scores on the immediate posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference was found between the performance scores of students in the explicit and the performance scores of students in the implicit spelling strategy groups ($t[32] = 1.32$, $MSe = 513.46$, $p > .05$).

Explicit and implicit strategy instruction students' performance scores on the immediate posttest, were compared to the traditional spelling (control) group using the Dunnett procedure. The critical value was $t(32) = 1.99$. The explicit strategy group significantly outperformed the traditional spelling

Table 4

Means and Standard Deviations for the Dictated Spelling Test Scored Developmentally for Pretest, Immediate and 14-Day Posttest as a Function of Experimental Condition

	Pretest		Immediate Posttest		14-Day Posttest	
Condition	M	S.D.	M	S.D.	M.	S.D.
Explicit Strategy Instruction	51.36	18.41	85.09	11.84	87.46	11.68
Implicit Strategy Instruction	54.91	23.01	72.82	18.37	73.46	16.45
Traditional Instruction	46.23	22.95	61.46	31.17	64.85	26.15

group (t[32] = 2.55, MSe = 513.49, p<.05). However, no significant difference existed between the implicit spelling strategy group performance scores and those of the traditional spelling group (t[32] = 1.18, MSe = 513.49, p>.05).

Explicit and implicit strategy instruction students' performance scores on the 14-day posttest were compared using the Dunn-Bonferroni procedure. The critical value was t(32) = 2.36. No significant difference existed between the performance scores of students in either the implicit or explicit strategy instruction groups (t[32] = 1.68, MSe = 383.54, p> .05).

Explicit and implicit strategy instruction students' performance scores on the 14-day posttest measure were compared to the traditional spelling group using the Dunnett Procedure. The critical value was t(32) = 1.99. A significant difference existed between the performance scores of students in the explicit and the performance scores of students in the traditional spelling group (t[32] = 2.82, MSe = 383.54, p< .05). However, no significant difference was found between the performance scores of students in the implicit-strategy group and the scores of students in the traditional spelling group, t(32) = 1.07, MSe = 383.54, p> .05.

Immediate and 14-Day Developmental Spelling Test Performance Scores

Table 5 displays the pretest, immediate and 14-day posttest Developmental Spelling test means and standard deviations as a function of experimental condition. Descriptively, performance scores from all three spelling groups increased from pretest to immediate posttest. Furthermore, gains were still noted 14 days following training.

Implicit and explicit strategy instruction students' performance scores on the immediate posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the performance scores of students in either the implicit or explicit strategy instruction groups ($t[32] = 0.04$, MSe = 25.05, $p>.05$).

Implicit and explicit strategy instruction students' performance scores on the immediate posttest were compared to the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference was found between the performance scores of students in the explicit strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.96$, MSe = 25.05, $p>.05$). In addition, no significant difference was found between the performance scores of

Table 5

Means and Standard Deviations for the Developmental Spelling Test for Pretest, Immediate and 14-Day Posttest as a Function of Experimental Condition

	Pretest		Immediate Posttest		14-Day Posttest	
Condition	M	S.D.	M	S.D.	M	S.D.
Explicit Strategy Instruction	15.73	2.83	17.23	3.64	19.64	2.46
Implicit Strategy Instruction	15.00	4.67	17.36	4.52	18.27	5.27
Traditional Instruction	13.31	5.54	15.31	6.22	14.92	5.85

students in the implicit strategy instruction group and the performance scores of students in the traditional spelling group ($t[32] = 0.96$, MSe = 25,05, $p > .05$).

Explicit and implicit strategy instruction students' performance scores on the 14-day posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the performance scores of students in the explicit strategy instruction group and the performance scores of students in the implicit strategy instruction group ($t[32] = 0.69$,MSe = 23.44, $p > .05$).

Explicit and implicit strategy instruction students' performance scores on the 14-day posttest were compared to the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the performance scores of students in the explicit instruction group and the performance scores of students in the traditional spelling group ($t[32] = 2.28$, MSe =23.44, $p<.05$). However, no significant difference existed between the performance scores of students in the implicit strategy instruction group and the performance scores of students in the traditional spelling group ($t[32] = 1.69$, MSe = 23.44, $p > .05$).

Learning Gains for Dictated Spelling and Developmental Spelling Scores

In order to measure the growth in learning between each testing period, a "difference" score was obtained for each spelling group. Comparisons were then made between each spelling group using these "growth" scores.

The growth scores for the Dictated Spelling Test from pretest to immediate posttest are listed in Table 6. Descriptively, the explicit strategy group showed the greatest growth in learning, followed by the implicit strategy group. The traditional spelling group showed the least growth in learning.

Explicit and implicit strategy instruction students' growth performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the growth performance scores of students in the implicit strategy instruction group and the growth performance scores of students in the explicit strategy group ($t[32] = 2.23$, $MSe = 11.86$, $p > .05$).

Explicit and implicit strategy instruction students' growth performance scores were compared to the growth performance scores of the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the growth performance scores of students in the

Table 6

Means and Standard Deviations for Dictated Spelling Test Growth in Learning for Pretest to Immediate Posttest and Pretest to 14-Day Posttest as a Function of Experimental Condition

	Pretest-Immediate Posttest		Pretest-14-Day Posttest	
Condition	M	S.D.	M	S.D.
Explicit Strategy Instruction.	8.27	2.05	9.00	2.28
Implicit Strategy Instruction	5.00	3.90	3.36	4.43
Traditional Instruction	4.46	3.93	3.69	3.52

explicit strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 2.70$, $MSe = 11.86$, $p < .05$). However, no significant difference existed between the growth performance scores of students in the implicit strategy instruction group and the growth performance scores of students in the traditional spelling group ($t[32] = 0.38$, $MSe = 11.86$, $p > .05$).

Table 6 displays the means and standard deviations of the growth scores for the Dictated Spelling Test for the pretest to 14-day posttest as a function of experimental condition. Descriptively, the explicit spelling strategy group made the most gains in learning from pretest to 14-day posttest, followed by the traditional spelling group. The implicit spelling group made the least gains in learning.

Explicit and implicit strategy instruction students' growth performance scores from pretest to 14-day posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. A significant difference existed between the growth performance scores of students in the explicit strategy group and the growth performance scores of students in the implicit strategy instruction group ($t[32] = 3.91$, $MSe = 12.40$, $p < .05$).

Explicit and implicit strategy instruction

students' growth performance scores from pretest to 14-day posttest were compared to the growth performance scores of students in the traditional spelling group from pretest to 14-day posttest using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the growth performance scores of students in the explicit strategy group and the growth performance scores of students in the traditional spelling strategy group ($t[32] = 3.68$, $MSe = 12.40$, $p < .05$). However, no significant difference existed between the growth performance scores of students in the implicit spelling strategy group and growth performance scores of students in the traditional spelling group ($t[32] = 0.22$, $MSe = 12.40$, $p > .05$).

Learning Gains for Dictated Spelling Test Scored Developmentally

Table 7 displays the means and standard deviations for the growth performance scores on the Dictated Spelling Test as a function of experimental condition. Descriptively, the explicit strategy group showed the greatest growth in learning from pretest to immediate posttest, followed by the implicit strategy group. The traditional spelling group showed the least growth in learning from pretest to immediate posttest.

Explicit and implicit strategy instruction

Table 7

Means and Standard Deviations for the Dictated Spelling Test Scored Developmentally Growth in Learning for Pretest to Immediate Posttest and Pretest to 14-Day Posttest as a Function of Experimental Condition

	Pretest-Immediate Posttest		Pretest-14-day Posttest	
Condition	M	S.D.	M	S.D.
Explicit Strategy Instruction	33.73	12.36	36.09	12.05
Implicit Strategy Instruction	17.91	15.59	18.55	16.54
Traditional Instruction	15.23	16.00	18.62	15.58

students' pretest to immediate posttest growth performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. A significant difference existed between the growth performance scores of students in the explicit strategy group and the growth performance scores of students in the implicit strategy group ($t(32) = 2.50$, MSe = 219.69, $p < .05$).

Explicit and implicit strategy instruction students' pretest to immediate posttest growth performance scores were compared to the traditional spelling group students' pretest to immediate posttest growth performance scores using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the growth performance scores of students in the explicit strategy instruction group and the growth performance scores of students in the traditional spelling group ($t[32] = 3.05$, MSe = 219.69, $p < .05$). However, no significant difference was found between the growth performance scores of students in the implicit spelling strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 0.44$, MSe =219.69, $p > .05$).

Table 7 displays the means and standard deviations for the growth performance scores for the Dictated Spelling Test from pretest to 14-day posttest as a

function of experimental condition. Descriptively, the explicit strategy group showed the greatest growth in learning from pretest to immediate posttest, followed by the traditional spelling group. The implicit strategy group showed the least growth in learning from pretest to immediate posttest.

Explicit and implicit strategy instruction students' pretest to 14-day posttest growth performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. A significant difference existed between the growth performance scores of students in the explicit strategy instruction group and the growth performance scores of students in the implicit strategy group ($t[32] = 2.87$, MSe = 221.89, $p < .05$).

Explicit and implicit strategy instruction students' pretest to 14-day posttest growth performance scores were compared to the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the growth performance scores of students in the explicit strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 2.86$, MSe = 221.89, $p < .05$). However, no significant difference existed between the growth performance scores of students in the implicit strategy

group and the growth performance scores of students in the traditional spelling group ($t[32] = 0.01$, $MSe = 221.89$, $p < .05$).

Learning Gains for Developmental Spelling Test

Table 8 displays the pretest to immediate and 14-day posttest mean growth scores and standard deviations for the Developmental Spelling Test, as a function of experimental condition. Descriptively, the explicit strategy group showed the greatest growth in learning from pretest to immediate posttest, followed by the implicit strategy group. The traditional spelling group (control) showed the least growth in learning over the same time period.

Explicit and implicit strategy instruction students' growth performance scores from pretest to immediate posttest were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the growth performance scores of students in the explicit strategy instruction group and the growth performance scores of students in the implicit strategy group ($t[32] = 0.48$, $MSe = 16.01$, $p > .05$).

Explicit and implicit strategy instruction students' growth performance scores were compared to the traditional spelling instruction growth performance

Table 8

Means and Standard Deviations for Developmental Spelling Test Growth in Learning for Pretest to Immediate Posttest and Pretest to 14-Day Posttest as a Function of Experimental Condition

	Pretest-Immediate Posttest		Pretest-14-Day Posttest	
Condition	M	S.D.	M	S.D.
Explicit Strategy Instruction	1.55	3.78	3.91	2.47
Implicit Strategy Instruction	2.36	4.59	3.27	3.17
Traditional Instruction	2.00	3.67	1.62	2.69

scores using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference existed between the growth performance scores of students in the explicit strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 0.28$, $MSe = 16.01$, $p > .05$). In addition, no significant difference was found between the growth performance scores of students in the implicit strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 0.22$, $MSe = 16.01$, $p > .05$).

Explicit and implicit strategy instruction students' pretest to 14-day posttest growth performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference existed between the growth performance scores of students in the explicit strategy instruction group and the growth performance scores of students in the implicit strategy instruction group ($t[32] = 0.56$, $MSe = 7.76$, $p > .05$).

Explicit and implicit strategy instruction students' growth performance scores were compared to the growth performance scores of the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference was found between the growth performance scores of students in the

explicit strategy group and the posttest growth performance scores of students in the traditional strategy group ($t[32] = 1.93$, MSe =7.76, $p > .05$). In addition, no significant difference existed between the growth performance scores of students in the implicit spelling strategy group and the growth performance scores of students in the traditional spelling group ($t[32] = 1.45$, MSe = 7.76, $p > .05$).

Sample Writings - Quantitative Analysis

Prior to the training sessions, subjects were asked to produce a four-line sample of writing. At the completion of the training sessions, each sample was dictated back to the appropriate subject, who then rewrote the writing sample. The writing samples were scored according to the proportion of correctly spelled words to incorrectly spelled words. Subjects could receive a possible percentage score of 100. Table 9 displays the means and standard deviations for the proportion of correct to incorrectly spelled words as a function of experimental condition. Descriptively, at posttest, the explicit group had the highest average percentage of words spelled correctly in samples of writing, followed by the implicit group. The control group had the lowest percentage of words spelled correctly in their samples of writing.

Table 9

Means and Standard Deviations for Sample Writings as to the Proportion of Correct to Incorrectly Spelled Words on Pretest and Immediate Posttest as a Function of Experimental Condition

	Pretest		Immediate Posttest	
Condition	M	S.D.	M	S.D.
Explicit Strategy Instruction	31.18	11.15	43.00	16.75
Implicit Strategy Instruction	28.00	19.27	40.82	21.54
Traditional Instruction	26.62	19.68	36.23	20.58

Explicit and implicit strategy instruction students' performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. No significant difference was found between the performance scores of students in the explicit strategy group and the performance scores of students in the implicit strategy group ($t[32] = 0.27$, $MSe = 391.38$, $p > .05$).

Explicit and implicit strategy instruction students' performance scores were compared to the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. No significant difference existed between the performance scores of students in the explicit strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.80$, $MSe = 391.38$, $p > .05$). In addition, no significant difference existed between the performance scores of students in the implicit strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.57$, $MSe = 391.38$, $p > .05$).

Qualitative Analysis of Sample Writings

In addition to analyzing the sample writings quantitatively, a qualitative analysis was completed on each sample of writing. For each sample of writing, a

sample writing sheet was completed (See Appendix D). The correct spellings for each passage were written in a column along the left side of the page. In the second column, the child's first attempt at spelling a word was recorded (pretest). The child's second attempt was recorded in the third column (at posttest). Any changes in spelling were noted on the right-hand side of the page. Students' sample writings were also examined as to their placement along the five developmental stages of spelling as outlined by Henderson and Templeton (1986).

Pretest Qualitative Analysis for Sample Writings

At pretest, only two students were writing at the Stage One spelling level, as outlined by Henderson and Templeton (1986). These students represented words with random letters (e.g., "turning the Christmas lights on" was spelled, "ctphmhn"; "going to my dad's house to play hockey" was spelled "pthllonisdhjaxojfrrtorhhotx"). The rest of the students in the study were writing at the Stage Two spelling level. As representative of this spelling stage, students from each spelling instruction group were using the correct or a phonetically related letter to represent the initial phoneme of words. Examples from the traditional instruction group include spelling "friend" as "f," "made" as "m," "animal" as "a"

and "Stanley Cup" as "S K." Examples from the implicit strategy group include spelling "got" as "g," "with" as "w," "green" as "g" and "was" as "w." Examples from the explicit strategy group include spelling "new" as "n," "Santa" as "S," "when" as "w," and "kiss" as "t."

Also, students from each spelling instruction group used either the correct or phonetically related letters to represent both the initial and final consonants of words. Examples from the traditional instruction group include spelling "went" as "wt," "penguins" as "ps" and "stick" as "sk." Examples from the implicit instruction group include spelling "like" as "lc," "got" as "gt" and "really" as "rl." Examples from the explicit instruction group include spelling "bugs" as "bgg," "had" as "hd" and "party" as "pd."

In addition, students in each spelling instruction group were attempting to represent vowels in the middle of words with phonetically related letters. According to Henderson and Templeton (1986), this is another characteristic of students who are writing at Stage Two. Examples from the traditional spelling group include spelling, "grandma" as "gam," "playing" as "pleying," and "went" as wat." Examples from the implicit strategy instruction group include spelling, "sleep" as "sep," "build" as "bald" and "went" as "yat." Examples from the explicit strategy instruction group include

spelling, "gave" as "gav," "rain" as "wen" and "house" as "has."

Another characteristic of Stage Two spellers is the omission of the letters "m" and "n" when these come before a final consonant (e.g., spelling "went" as "wet"). For example, a student from the traditional spelling group spelled the word "went" as "weto." Similarly, a student from the implicit strategy group spelled "went" as "yat," and a student from the explicit strategy group spelled "went" as "wat."

Moreover, children in all three spelling instruction groups used a number of common sight words in their spellings. According to Henderson and Templeton (1986), this is a more common characteristic of students at Stage Three. Common sight words that students from all three spelling instruction groups used in their sample writings include "I," "am," "me," "my," "and," "the," "to," "go," "like," "in," "is," "we" and "in."

Posttest Qualitative Analysis of Sample Writings

Qualitative evaluations of the sample writings reveal that students in all three spelling instruction groups demonstrated improvement in their attempts at spelling words from pretest to posttest.

The two students who were writing at Stage One at

pretest (and who received traditional spelling instruction), were now using the correct or phonetically correct letters to spell words. In addition, they were using sight words and inserting spaces between words in their writings. For example, "I am going to my dad's house to play hockey" was now spelled, "I am gomg to my dad ho to p h" and "turning the Christmas light on" was now spelled, "te ksms l ane."

For those students writing at a Stage Two level at pretest, improvements in spelling were also noted. Students from all three instruction groups were representing final phonemes of words at posttest, whereas they only represented the initial phoneme at pretest. Examples from the traditional spelling group include spelling "friend" as "f" at pretest and "fd" at posttest, "stanley" as "s" at pretest and "sl" at posttest, and "with" as "w" at pretest and "wf" at posttest. Examples from the implicit strategy group include spelling "with" as "w" at pretest and "wt" at posttest, "gardens" as "gr" at pretest and "grdns" at posttest, and "got" as "g" at pretest and "gt" at posttest. Examples from the explicit strategy group include spelling "new" as "n" at pretest and "nw" at posttest, "when" as "w" at pretest and "wn" at posttest and "remember" as "r" at pretest and "rr" at posttest.

In addition, students from all three instructional

groups were representing middle vowels in words at posttest, which were not represented at pretest. Examples from the traditional spelling group include spelling "made" as "m" at pretest and "mad" at posttest, "went" as "wt" at pretest and "wart" at posttest and spelling "over" as "ov" at pretest and "ofhr" at posttest. Examples from the implicit instruction group include spelling "green" as "g" at pretest and "gen" at posttest, "really" as "rl" at pretest and "rel" at posttest, and "came" as "cm" at pretest and "cam" at posttest. Examples from the explicit instruction group include spelling "party" at "pd" at pretest and "pid" at posttest, "horse" as "hs" at pretest and "huoas" at posttest, and spelling "doll" as "d" at pretest and "dael" at posttest.

A closer examination of the posttest writing samples indicated that certain students were attempting to spell vowel patterns, which is characteristic of Stage Three writing. Examples from the traditional spelling group include spelling "went" as "wat" at pretest and "weait" at posttest, and spelling "teeth" as "taf" at pretest and "taeh" at posttest. An example from the implicit instruction group included spelling "house" as "hones" at pretest and "hoes" at posttest. Examples from the explicit instruction group include spelling "horse" as "hs" at pretest and "huoas" at

posttest, "doll" as "d" at pretest and "dael" at posttest and spelling "sleep" as "slep" at pretest and "sleep" at posttest.

With respect to omitting the letter "n" in the final cluster "nt" in the word "went", only slight improvement was noted from pretest to posttest. Two sample writings from students in the traditional instruction group included the word "went." One student spelled the word "went" as "weto" at pretest and "wtint" at posttest. The other student spelled "went" as "wat" at pretest and "weait" at posttest. As for the implicit instruction group, only one student included the word "went" in her writing. For this student, the word "went" was spelled "yat" at pretest and "wat" at posttest. For the explicit instruction group, only one student included the word "went" in his writing, and spelled "went" as "wat" at pretest and "wet" at posttest. Another student in the explicit-instruction group used the word "want" in his writings and spelled the word "want" as "wot" at pretest and "wont" at posttest. Therefore, only two students included the "n" in the final "nt" cluster found in words.

As for correctly spelled sight words, moderate improvements were noted across all three instruction groups. At posttest, several new words were spelled correctly which had not been spelled correctly at

pretest. New sight words for students in the traditional spelling group include, "for," "are," "the," "got," "playing" and "penguins." New sight words for students in the implicit instruction group include "got," "it," "in," "am," "play," "with," "she," "like" and "red." New sight words for students in the explicit instruction group include "bunny," "mom," "play," "Santa," "fun," "him," "bud,' "got," "and" and "sleep".

Metacognitive Spelling Test

At the end of the training session, each child was asked to elaborate on what was happening in his/her "mind" when he/she was asked to spell words. Specifically, the children were asked, "What do you do when you don't know how to spell a word?" If necessary, children were given an example word and asked, "What do you do if you don't know how to spell the word, `man'?" Children's responses were scored as to whether they mentioned one or more of the spelling strategies used in training. One point was given for each strategy mentioned in the study. No point was given if children mentioned any other effective strategy, (e.g., "I ask my mother how to spell the word").

Table 10 displays the mean performance scores and standard deviations for the metacognitive spelling test

Table 10

Means and Standard Deviations for Metacognitive Spelling Test for the Immediate Posttest as a Function of Experimental Condition

Condition	Immediate Posttest M	Immediate Posttest S.D.
Explicit Strategy Instruction	2.55	0.69
Implicit Strategy Instruction	1.00	0.00
Traditional Instruction	0.92	0.49

as a function of experimental condition. Descriptively, children in the explicit strategy instruction group were more able to identify the spelling strategies used in this study than students in the implicit strategy instruction group and students in the traditional spelling group. Students in the implicit strategy group and the traditional spelling group only named one strategy used in this study - phonology. Other strategies were mentioned by students in all spelling groups such as, asking a parent or teacher how to spell a word, looking for words on charts in the classroom, and using a dictionary.

Explicit and implicit strategy instruction students' performance scores were compared using the Dunn-Bonferroni procedure. The critical value was $t(32) = 2.36$. A significant difference existed between the performance scores of students in the explicit strategy group and the performance scores of students in the implicit strategy instruction group ($t[32] = 4.81$, $MSe = 0.62$, $p<.05$).

Explicit and implicit strategy instruction students' performance scores were compared to the performance scores of students in the traditional spelling group using the Dunnett procedure. The critical value was $t(32) = 1.99$. A significant difference existed between the performance scores of

students in the explicit instruction group and the performance scores of students in the traditional spelling group ($t[32] = 5.05$, $MSe = 0.62$, $p < .05$). However, no significant difference existed between the performance scores of students in the implicit spelling strategy group and the performance scores of students in the traditional spelling group ($t[32] = 0.24$, $MSe = 0.62$, $p > .05$).

Summary of Findings

Prior to training, no differences existed between the three experimental conditions on any of the pretest measures. At the completion of the training sessions, students who received explicit strategy instruction outperformed students who received traditional spelling instruction on the Dictated Spelling Test. On the same test taken 14 days later, students who received explicit strategy instruction continued to perform better than students who received traditional spelling instruction, and even performed better than those students who received implicit strategy instruction. Similar results were obtained when the spellings from the Dictated Spelling Test were scored developmentally.

On the Developmental Spelling Test, no differences existed between the performances of students who received explicit strategy, implicit strategy or

traditional spelling instruction at posttest. However, 14 days following, students who received explicit strategy instruction outperformed those students who received traditional spelling instruction. When the growth in learning scores for the Developmental Spelling Test were examined, no differences existed between the three spelling groups.

When the growth in learning scores on the Dictated Spelling Test were examined, students who received explicit strategy instruction demonstrated the greatest growth in learning from pretest to posttest. Even 14 days following, the explicit instruction students continued to show the greatest growth in learning when compared to both the implicit and traditional instruction students. Moreover, when the spellings from the Dictated Spelling Test were scored developmentally, the students who received explicit strategy instruction demonstrated a greater growth in learning from pretest to posttest and from pretest to 14-day follow-up than students who received either implicit strategy or traditional spelling instruction.

As for the number of correctly spelled words in the sample writings, no difference existed between the writings of students in the three spelling instructional groups. Even when the sample writings were qualitatively examined, no difference existed

between the sample writings of students in the three spelling groups.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, IMPLICATIONS

The purpose of this study was to determine whether teaching children a variety of spelling strategies would be more effective at improving children's early spellings than providing them with a traditional spelling program. In addition, this study investigated the effectiveness of two types of spelling strategy instructions - explicit versus implicit. This section will review the findings of this study and previous research with respect to spelling interventions. In addition, educational implications of this research and recommendations for future investigation will be presented.

Conclusions

It was hypothesized that children who received explicit strategy instruction would make the greatest gains in the area of spelling, relative to children who received implicit strategy instruction or traditional spelling instruction. In general, the data from this study support this hypothesis. Children, who were trained to use phonology, imagery and analogy and who were given explicit instructions in the application of these three strategies, were able to spell more target words correctly. In addition, when the spellings (both correct and incorrect) of the target words were scored

developmentally, explicit strategy instruction children's spellings more closely resembled the correct spellings than did implicit and traditional instruction children's spellings. Moreover, children who received explicit strategy instruction showed the greatest improvement in the spelling of target words from pretest to immediate posttest than did children who received either implicit strategy instruction or traditional spelling instruction. Most impressively, these spelling gains were maintained two weeks after the completion of the training session.

The effects of training children in the use of these three effective strategies were evident in the spellings of children as young as Grade One. The children in this study were at the very early stages of spelling development, and yet were very capable at applying the three trained strategies when spelling target words. Thus, it appears that explicitly instructing children in the use of phonology, imagery and analogy strategies is an effective instructional program to increase children's spelling performance of target words.

It was also hypothesized that the implicit strategy group would outperform the traditional spelling group (control). Descriptively, the implicit strategy group performed better than the traditional spelling group on

all posttest measures (except the metacognitive spelling test). However, statistical analysis of the research did not support this hypothesis. Although the performance scores of children from both the implicit strategy group and the traditional spelling group improved from pretest to posttest, neither group outperformed the other on spelling the target words. Therefore, implicit strategy instruction (phonology, imagery and analogy) was no more effective at improving children's spelling performances than was traditional spelling instruction.

The findings from this study support other research suggesting that effective strategy use can only occur when children are also provided explicit instruction (Pressley, Borkowski & Schneider, 1987). Simply providing young children with activities which are based on spelling strategies is not sufficient to enhance spelling performance. In fact, such instruction is no more effective than traditional approaches where children repeatedly copy out target words. In contrast, explicit instruction provides children with direct explanations about spelling strategies and how these strategies can be applied in their daily writing experiences. These discussions enable children to use spelling strategies more effectively and therefore improve their spelling. In addition, when asked what

they would do when they needed to spell an unfamiliar word, children who received explicit strategy instruction reported using more spelling strategies than children who received either implicit strategy instruction or traditional instruction. Thus, it appears that providing children with opportunities to discuss spelling strategies and their application, promotes children to use spelling strategies when spelling unknown words.

While the results of this study support the effectiveness of explicit strategy instruction for enhancing childrens' spellings of target words, similar results were not found for measures of children's "general" spelling behaviour. Results from the Developmental Spelling Test (Tangel & Blachman, 1992) (a test which is sensitive to the developmental movement of children's spelling) revealed that no one spelling instructional group significantly outperformed another from pretest to immediate posttest. Nor did one spelling group make significantly greater gains in learning relative to another group from pretest to immediate posttest. However, a significant difference was found on the Developmental Spelling Test taken two weeks following training. Students who received explicit strategy instruction outperformed those students who received traditional spelling instruction. Thus, no one

group performed significantly better than another on the Developmental Spelling Test until two weeks following the completion of the training sessions.

In addition, when sample writings were scored with respect to the number of correctly spelled words, no one group outperformed another. Descriptively, explicit strategy group students' sample writings had the highest percentage of correctly spelled words at posttest, followed by the implicit strategy group students' sample writings. The sample writings of students in the traditional spelling group contained the lowest percentage of correctly spelled words at posttest. However, these findings did not reach statistical significance.

When the sample writings were analyzed qualitatively, similar results were found. Although sample writings from all three instructional groups demonstrated an improvement in spelling, no differences existed between the sample writings. Students improved their spelling through the use of correct or phonetically related letters in the initial and final phonemes of words (e.g., spelled "friend" as "f" at pretest and "fd" at posttest). Improvement was also noted with the insertion of vowels in words through the use of a correct or phonetically related letter or pattern of letters (e.g., spelled "horse" as "hs" at

pretest and "huoas" at posttest). Increased use of sight words throughout their samples was also noted.

Several possible explanations exist as to why no significant differences in "general" spelling performance were noted between any of the spelling groups on the Developmental Spelling Test or in the sample writings. To begin, no opportunities were provided in this study for students in either the implicit or explicit strategy group to directly apply the spelling strategies learned in training to written work. (Students in the traditional spelling group did have to write two sentences using target words as part of one activity included in their spelling program). Although all students wrote in their journals on a daily basis throughout this study, no specific time was allotted directly following each training session to adequately prepare students for the application or transfer of skills to real writing situations. Thus, there were no differences found amongst the sample writings.

In addition, time may be an important factor in this issue. Perhaps not enough time was allocated from pretest to posttest for the transference of the strategies learned in training to written work. Providing children with more time and opportunities to internalize these strategies may have resulted in

students applying these strategies more readily when writing. This may be why a significant difference between the performance scores on the Developmental Spelling Test was not obtained until two weeks following the completion of the training sessions.

Finally, for the Developmental Spelling Test, one explanation could be that the combination of strategies taught was simply not applicable to the five words used on the Developmental Spelling Test (lap, sick, train, elephant, pretty). For children to effectively use the imagery strategy, they would need to have first seen the word spelled correctly and have had numerous exposures to the word. For children to apply the analogy strategy, they would first need to know how to correctly spell a word that rhymed with a particular word used in this test or know how to correctly spell some salient part of a word that could be used to spell a word in this test. Of the three strategies taught, phonology is the only strategy that the students could apply when spelling these words. Though research has found this strategy to be an effective strategy (Ball & Blachman, 1988, 1991; Cunnungham, 1990; Mann, Tobin & Wilson, 1987) perhaps, again, not enough time was allotted to allow students to accurately transfer strategies. Thus, there was no difference amongst the spelling groups until two weeks following the completion of the training

sessions.

To summarize, explicit strategy instruction was the most effective spelling program for improving Grade One children's invented spellings. Children who received this instruction were able to spell targeted words more accurately and were able to recall more effective spelling strategies than those who received either implicit strategy instruction or traditional spelling instruction.

Implications for Practice, Theory and Future Research

Educational Implications

Traditionally, spelling has been viewed as a memorizing task. Teachers taught spelling in isolation, providing lists of words to be memorized for weekly spelling tests. Spelling manuals provided teachers with concise, organized lessons which required little preparation. Evaluation was clear and easy - the number of correct words right out of the total list of words. How children actually learned how to spell or acquired good spelling skills did not appear to be an issue.

Recent research into spelling, however, has revealed that spelling is not simply the memorization of letters or words, but a cognitive process that is developmental in nature. For teachers to effectively help all children learn to spell, they must link their

spelling instruction to the findings of research on spelling development. And, as the findings of this study revealed, for spelling instruction to be effective it must be strategy based, and be sensitive to the developmental needs of children. The strategies used in this study reflected the level of spelling development at which the students were writing. Phonology was appropriate for the students in this study who were matching sounds in words with their corresponding letters. Imagery and analogy were useful for those students who were using sight words in their writings or who knew some basic sight words on which other spellings could be created. Teachers must educate themselves on how children learn and make themselves aware of effective spelling strategies that really work. For pre-service teachers this can be achieved through classroom instruction or through workshops and presentations which can also be held for experienced teachers.

For strategy instruction to be effective, it must be explicit. Teachers must directly instruct their students in the use and application of strategies in their daily writing experiences. Children should not be left to induce spelling strategies from repeated workbook exercises, but receive explicit instruction and feedback about the target skills. Students must be cued

as to what strategy is being taught, when it would be useful and how to apply it in the appropriate situation. In addition, teachers must model effective strategy use themselves and encourage children to explicitly model effective strategy use to each other. Teachers must also create an inviting atmosphere which promotes discussion on strategies and strategy use. This can easily be done through co-operative learning. Co-operative learning provides students with opportunities to work together to complete tasks, and creates an arena for teachers and students to discuss their learning (Hutchison, 1990).

Children as young as seven years of age were able to discuss the features of strategies, the importance of using strategies when spelling, and were able to discuss how they could use particular strategies in their writing experiences. Therefore, even young children can become more metacognitively aware of their learning. Thus, all elementary teachers and students can benefit from explicit strategy instruction.

Although this study focused on explicit strategy instruction in spelling, metacognition and explicit instruction can be used to enhance all areas of learning. Numerous studies already exist which suggest that metacognitive instruction improves early reading skills (Evans, Taylor & Blum, 1979) and reading

comprehension (Cross & Paris, 1988; Kurtz, 1988; Paris & Lindaurer, 1982). Thus, teachers in all areas of the curriculum should be encouraged to create instructional programs which include metacognitive information about strategies, and instruction about how to monitor strategy effectiveness.

Moreover, strategy instruction should not be taught in isolation as a separate lesson. Teachers should remember to incorporate strategy instruction in their everyday lessons through modeling, co-operative learning and discussions.

Theoretical Implications

This study greatly supports the use of strategy instruction in the area of spelling, especially early spelling development. This study also supports multiple strategy instruction in which children receive instruction on a variety of strategies. As noted earlier, Yee (1969, as cited in Woloshyn and Pressley, 1990) found that good spellers knew and used a variety of strategies to spell difficult words. Whereas, poor spellers relied on only one strategy. Therefore, multiple strategy instruction can familiarize children with numerous strategies which they can apply in various spelling situations.

The use of metacognition in addition to strategy

instruction was also supported by this study. Strategy instruction was enhanced by having students and teachers engage in discussions about strategies and their application.

The findings of this study also support previous research which validates the use of strategy instruction in the fostering of spelling development (Woloshyn & Pressley, 1990; Scott, 1993). In order for strategies to be effective, however, they must be sensitive to the developmental needs of students. Phonology, imagery and analogy were found to be very applicable to the writing skills of the students in this study. Therefore, spelling development can be enhanced through instruction on effective strategies.

Recommendations for Future Research

Several recommendations exist which would enhance this present study should it be replicated. In order to further validate the findings of this study, and make the study more generalizable, a larger sample size should be used. Several Grade One classes from schools of varying socio-economical backgrounds could be used. In addition, it would be interesting to see if similar results would be obtained had children received whole-group instruction versus small-group instruction.

In addition to the writing samples, it would have

been interesting to have the children complete a dictated writing passage which included several target words. This could have been an effective measure of the children's ability to apply the target words when writing.

While the value of this study can have immediate impact on spelling programming, it also raises issues for future research. Which spelling strategies are effective at the various developmental levels of spelling must be determined and made available to teachers in order to help them create more effective spelling programs. In addition, an examination of the success of explicit strategy instruction on spelling performances at the junior level would also be beneficial. Finally, a longitudinal investigation of the effects of consecutive years of explicit strategy instruction on spelling performances would be beneficial for establishing strategy instruction as the foundation for spelling instruction.

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Appendix A: Parental Consent Form

To The Parents of Grade One Students:

As part of the requirements to complete my Master's Degree in Education, I plan to carry out a study to investigate young children's spelling development and teaching techniques that might promote better spelling. Basically, I will be studying the effects of different types of spelling instruction. One group of children will be trained how to use spelling strategies and will be provided explicit instructions in when to use these strategies. Another group of children will be provided implicit spelling strategies instruction or will be given traditional spelling instruction. The purpose of this letter is to request your permission for your child to participate in this study.

Small groups of 4 to 5 children will be seen by me for 30 minutes sessions over 4 weeks. Students will remain in the classroom for these sessions. In each session, children will receive instruction regarding the use of several spelling strategies or various language arts activities. For example, children will play games in which they have to count the number of sounds in words, visualize words on screens, and create new words through rhyme.

In the past, activities like these have been found to improve children's spelling performances. I am particularly interested in confirming whether providing children with explicit instructions about these strategies will result in greater spelling improvement.

In general, children enjoy participating in these types of sessions. However, if for any reason, a child indicates that he/she does not wish to continue, the student will be removed from the study immediately. All data from this study will be stored anonymously in order to protect the privacy of students. No information from student records will be used, nor will any student's status in the classroom be affected by their decision to participate in this study.

This study has been officially approved by our Principal, Peter Milovanovic, the Halton Board of Education's Research Advisory Committee, and Brock University. When the study is complete, a report on the findings will be made available to all parents. All grade one students will be told about effective ways to improve their spelling.

Please return the attached consent form to me or

Mrs. Berardine as soon as possible indicating whether you give your permission for your son/daughter to participate in the study. Please note that it is important that you return the form in either case. If you have any questions or concerns about this study, please feel free to contact me at school (335-0679), or my thesis advisor, Dr. Vera Woloshyn, PhD. (416-688-5550, ex. 3340).

Thank you,

Kelly Kernaghan
Grade One Teacher
Bruce T. Lindley School
2510 Cavendish Dr.
Burlington, Ontario
L7P 4B2

.....

Child's Name:_____

CHECK HERE

____ I give permission for my child to participate in the study.

____ I do NOT give permission for my child to participate in the study.

Signature of parent/guardian_____

Please Return As Soon As Possible.

If you would like a complete summary of the findings of this study, please complete the form below:

Name:_____

Address:_____

Appendix B

Developmental Spelling Test

a b c d e f g h i j k l m n o p q r s t u v w x y z

nt # _____

e_____

Appendix B

Developmental Spelling Test Rating Scale

Scoring for: lap, sick, train

0 - A random string of letters.
1 - The initial phoneme represented with a phonetically related letter. May be followed by a random string. (e.g., train - j, g, ch, h)
  - Single letter responses that represent some silent part of the word other than the initial phoneme. May be followed by a random string. (e.g., lap: p; sick: c, k; train: r, a, n).

2 - The correct initial phoneme of the word. May by followed by a random string or an alphabet string. (e.g., lap: lmnop; sick: stub, sih; train: toonum).

3 - More than one phoneme but not all. Must be represented with phonetically related or conventional letters. May include intrusions. When the intrusion is removed, the rest of the letters should be in proper sequence. (e.g., lap: ltp, lpa; sich: se, sib, sk, ck; train: tam, jra, tan).

  - Every phoneme represented, but not all with phonetically related letters. (e.g., lap: fab, eap; sick: cit; train: san).

4 - Every phoneme including the blend, represented with a mix of phonetically related and conventional letters. May include intrusions. (e.g., lap: labt, rap; sick: siack, sec, sek; train: tren).

5 - All consonant phonemes, including the initial blend, represented with conventional letters; the correct short vowel, or an attempt to mark the long vowel. (e.g., sick: sic; train: trane).

6 - The correct spelling

Appendix B

Scoring Criteria: elephant

0 - A random string of letters.

1 - A single letter that represents some salient part of the word other than the initial phoneme. May be followed by a random string.
or
The initial syllable represented by e or el. May be followed by a random string.
or
Any two phonemes from the word (must be in proper sequence) and may be followed by a random string.

2 - The middle syllable may be represented with any vowel (e.g., ltfnoa, efl, lolot, le or ell, al, or el plus any one phoneme. - alf, elf).

3 - One or two letters from the initial syllable (e, l, el, al, ll) plus two phonemes from the third syllable. (e.g., eft, lfax, alft, llft)
or
The initial syllable represented by l or el, e, plus three phonemes from the third syllable (e.g., efanl, elfit).

4 - The initial syllable represented with l or el, a vowel to represent the middle syllable and three phonemes from the last syllable. May not include intrusions (e.g., lefan, lifit, elufit).

5 - The initial syllable represented, a vowel for the middle syllable, and four conventional or phonetically related phonemes from the third syllable (e.g., elufint).

6 - The correct spelling.

Scoring Criteria: pretty

0 - A random string of letters.
1 - One phonetically related letter. May be followed by a random string.
or
Single letter response that represents some salient part of the word other than the initial phoneme. May be followed by a random string (e.g., e, t, r, d).

Appendix B

2 - The correct initial phoneme of the word. May be followed by a random string or an alphabet string (e.g., pqrst, psmtflsp).

3 - Two or three phonemes from the first syllable, with conventional or phonetically related letters. The initial blend is absent (e.g., pd, pi, ptt, pit, ped, pid).
or
The initial blend correctly represented or represented with a vowel between it. May be followed by a random string (e.g., pr, prmtzsa, par, pir)
or
The first and last syllable represented, but the blend is absent (e.g., pte, pie, pe).

4 - Every phoneme of the first syllable including the initial blend; appropriate vowel with conventional or phonetically related letters (e.g., pret, pred)
or
Both syllables represented, first syllable vowel present, but the blend is absent (e.g., pidy, petee).

5 - All consonant phonemes of the first syllable, including the initial blend, with phonetically related or conventional letters, plus a vowel in the second syllable
(e.g., predy, prete).

6. The correct spelling.

Appendix B

Scoring For Developmental Spelling Test (examples)

0	1	2	3	4	5	6
lap	a	p pa l	lb lpr lp lpa	lhp lab lip lep	latp laop lpap lahp	lap
sick	c	s stsat saoh soh	sk sc ska skk skb	sak saik sek sah seq sac shc saca	sik sic sitc	sick
train	na j	t nrnyh ch cmrnrm	sann tn han cn ting jan tan hrni toan hnm jhn	trin cran	tran trarn	train
elephant	el e l a	et latt ef aon eafare raf	lfa elfni eft lfta let lat alaft eilaft	elafet elafat elafit	alafhht	elephant
pretty	b	p pn pa	pr pet pt pat pta prt	pette pte perty primt pate prte phte	prete prtty prette praty	pretty

Appendix C

Dictated Spelling Test

1. had _____
2. let _____
3. can _____
4. yes _____
5. bet _____
6. mother _____
7. has _____
8. pet _____
9. fan _____
10. Ted _____
11. man _____
12. bed _____
13. the _____
14. at _____
15. men _____
16. am _____
17. Ned _____
18. rat _____
19. Pam _____
20. bad _____

Student # _____ Score: _____

Appendix C

Scoring Criteria For Spelling Dictation Test

Scoring for words: had, let, can, yes, bet, has, pet, fan, Ted, man, bed, men, Ned, rat, pam, bad.

*For examples of scored words see Appendix C

0 - A random string of letters.

1 - The initial phoneme represented with a phonetically related letter. May be followed by a random string.
- Single letter response that represents some salient part of the word other than the initial phonemes. May be followed by a random string.

2 - Two phonemes of the word represented, either with correct representation or with phonetically related letters; may be followed by a random string of letters.

3 - beginning, middle and ending phonemes are all represented but with phonetically related letters or with a combination of both correct and related letters.

4 - beginning and ending phonemes are represented correctly and middle vowel is represented with the letter that is most closely associated with that letter according to the developmental stages of spelling (e.g., short "a" is represented with "e", short "e" with "a", short "i" with "e", short "o" with "i", short "u" with "o", and "oo" with "u").

5 - the correct spelling.

Scoring for: mother

0 - A random string of letters.

1 - The initial phoneme is represented by the correct letter or by a phonetically related letter.
- A letter that represents some salient part of the word other than the initial phoneme andis represented by either the correct letter or a phonetically related letter. May be followed by a random string of letters.

2 - The initial phoneme followed by one letter representing any other salient part of the word.

Appendix C

3 - One or two phonemes from the first syllable, followed by an attempt at the digraph "th", which may or may not be followed by the final phoneme.
- Two phonemes from the first syllable, and one letter representing any other salient part of the word.

4 - The correct initial phoneme, an attempt at the vowel, the correct spelling of "th" followed by one or two letters representing the final phoneme.

5 - the correct spelling

Scoring for: the

0 - A random string of letters.

1 - The representation of the beginning phoneme with the correct letter or a phonetically related letter. May be followed by a random string of letters.

2 - The correct representation of the initial phoneme followed by an attempt at the ending vowel.

3 - The correct spelling of the digraph "th" followed by an attempt at the ending vowel with any vowel letter except "a" which is the letter that is closest in prononciation to the short vowel sound "e" according the developmental stages of spelling.

4- The correct spelling of the digraph "th" followed by the letter "a" which may be followed by a string of random letters or may have an intrusion.

5 - The correct spelling.

Scoring for: am

0 - A random string of letters

1 - The representation of the initial or ending phoneme by a phonetically related letter. May be followed by a random string of letters.
2 - The representation of both phonemes, however they are represented by phonetically related letters.
3 - The correct second phoneme. The initial phoneme is represented by the letter that is closest in sound to the short "a" sound, in this case, "e".
4 - Both initial and end phonemes are represented by the correct letters, however, intursions exist between these phonemes.

Appendix C

5 - The correct spelling.

Scoring for: at

0 - A random string of letters.

1 - The representation of the initial or ending phoneme by a phonetically related letter.
2 - The representation of both phonemes, however they are represented by phonetically related letters.
3 - The correct second phoneme. The initial phoneme is represented by the letter that is closest in sound to the short "a", in this case, "e".
4 - Both initial and ending phonemes are represented by the correct letters, however, intrusions exist between these phonemes.

APPENDIX C

Scoring For Spelling Dictation Test

	0	1	2		3		4	5
had		h	hd	aed	htd		hed	had
		d	ha	hdr	hdd			
		byd	ad	hdh	hat			
			hdia	hsd	hod			
			hdao	han				
			htd	hdd				
let		l	la	lth	lit		lat	let
		t	lt	lht	lut		laot	
			tlt	ltia	liet		ltat	
			le	ltt	ltut		last	
				lts				
can	l	k	cn	cnt	chn	kan	caon	can
	den	c	kn	cni	kin	kaan	cen	
		ckt	knn	knk	cin	ken		
		ct	ca	cnoa	cern			
			cna	hn	cun			
			kar					
yes		a	es	yls	gas		yas	yes
		ea	ys	essa	jas		yees	
		s	ya	ees	ehas		yhas	
		das	ws	ets	yus			
		y	ysh	wsis	yos			
		vssa	yls	ussa	jes			
		wsis	yoe	yss				
		u						
		la						
		yon						
		ls						
bet	p	b	bta	bt	bht		bat	bet
		bn	btati	btt	bit		baiut	
		ba	btkt	btas	but		baet	
			bnt	bth	bot			
			btah		bad			
mother		m	mr		mad	mth	momther	
mother								
			mom		momr	mahr	mathr	
			mo		mors	mtr	mathir	
			mhm		mthr	momrta	mathaer	
			moriy		mutr	mlhr	mothr	

Appendix C

	0	1	2	3	4	5
			mrer mrr myronr	momyr moatr moth meth	mathrar momthr methr	
has	tosx on	h s aah sz hoe vsa	ha hss hs hts he hsa as hfsf hsa hi hsh hfse	his haz	hes hesbah hazs hesz hasdr ehas	has
pet		p t tisi	ptas ptr pt ptt papas btt pth it pnt iat ptoi pe pst btiat pa ptas	pht put pit pott	pat paot pets pant	pet
fan	tisi iat it iath teots	f v n nhn thon frst	fnf faa faui fnn faiut fa fna fnar fn fo	fin fhn fon foni	fen fanna faon fana faern faan	fan
ted	aotxxot	t tn	td tan te ta tdrt tdb ten toea tal tal thar tae tdrt tda tdam	thd tod tid teots tit tydd tut	tad tadd taad tahd tead tedd tabd	ted
man		m mla nnai	mn mnn mah mao mah mat ma	min mem myn mon mhn mam	mann man men manm	

Appendix C

	0	1	2	3	4 5
bed	ptep nuere	b p fd brbl	bdh be bdh ba btd bnd bths bdb	bid bodat pedt bdeat	bad bed badd
the	nhn in lamto n fe my lh in	dt v atd tet	tae hte teh	th	thah the
at	tha toie	a i t ptot	ae tat	it aot ant aht art aet	ath at aat atr att ata atd atni
men	otw	m n mr otm	mnh mnt mn em mna mnm mad mhs mns	mhn min mem mom mam	maon men mana man manet mann
am	pe	a m a tm mm mny mi iaa	ma may mand an	mam im anm arm em ahm	amm am
Ned	mht mto te l	n h na	nd ntd ndd nda mdh ndn mdh ndr	nid nat nut nit nod	nad ned nadh noad

Appendix C

0	1	2		3	4	5
		dnie ntdt		mad net ndad		
rat	noatl toptlh	r	rd wt rtd trsr tat	rt rtar rty rtt rth rta cat	rht rit rut rhd yatre rtat	ret rat raot rait
pam	urtl	p b tma polhs pol tmna thma bm	pa pn hym mpn pnm cam hem	pm ham pmm pmi im hm	phm pan pen	pem pam panm peam paom peem pamam pami pama
bad	pdlhs	b br bn dd ba hbre bna dk	bt bdh bnd	bd bdd bda ba	bhd bat bid but	bed bad baed berd bhatd

Appendix D

Sample Writing Scoring Sheet

Target Word	Pretest	Posttest	Comments

Appendix E

Test of Metacognition

Name_____

C_____ I_____ E_____

What do you do when you don't know how to spell a word?

_____ sound it out (phonology)

_____ think of a picture of the word in my mind (imagery)

_____ think about whether it rhymes with another word (analogy)

OTHER_____

_____

Appendix F

Lesson Plans: Control Group - Traditional Spelling.

Lesson One and Two:

Objectives: Children will learn how to spell 10 target words

Target Words: at, had, I, man, a, am, has, ran, cat, can.

Materials: Spelling (1990) pages, 52-55.

Procedure:

The teacher will introduce the spelling words to the children. Each word will be presented on a file card. The children will repeat the words back to the teacher.

Children will complete the spelling activities on these ten words over two lessons. Since the activities use all the ten words, the list could not be divided into two smaller lists.

In lesson one, children will complete pages 52 and 53 in which they have to copy the words out two times each and complete closure sentences.

In lesson two, children will complete pages 54-55 in which they have to write the missing letters to the target words, write a sentence using the target words and copy a sentence and draw a picture.

Appendix F

Lesson Plans: Control Group

Lessons Three and Four.

Target words: the, yes, get, red, mother, let, bed, men, pet, fed.

Materials: Spelling (1990) pages 60-63.

Procedure:
The teacher will present the target words to the children on file cards. The teacher will have the children repeat the words back to her.

Children will complete pages 60 and 61 during lesson one in which the children are required to write the correct target word for the meaning given (e.g., given: mom; write: mother), find target words in chains of letters and write a sentence using a target word. In lesson two, children will complete pages 62 and 63 in which they have to provide the correct spelling word for the picture given, write the spelling words that rhyme with a particular word, draw a picture of a pet and write about it.

at

had

I *

man

a *

am

has

ran

cat

can

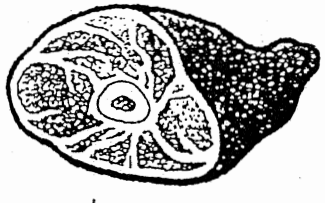
LESSON 13 Target: Short a

A Write the words that rhyme.

hat

van

Dad



ham

Home Base Words.

LESSON 13

B Write the spelling word that fits in each sentence.

ran / man

A dog _____ in the yard.

has / am

I _____ six years old.

at / can

She is _____ school.

ran / cat

My _____ drinks milk.

has / am

He _____ a new Bible.

had / cat

I _____ fun at the park.

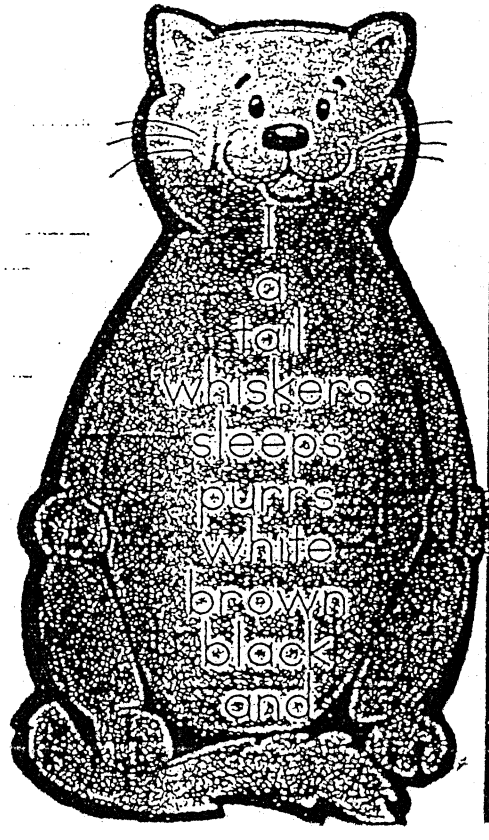
C Write the missing letters. Write the words.

m _ n

c _ t

r _ n

D Tell about a cat you have seen.



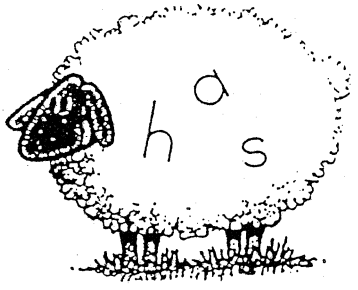
LESSON 13

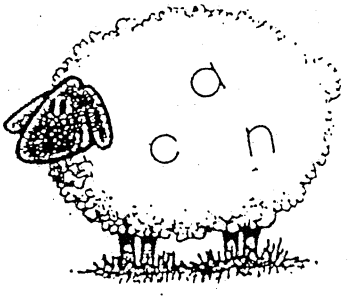
E Write the sentence. Draw and color a picture.

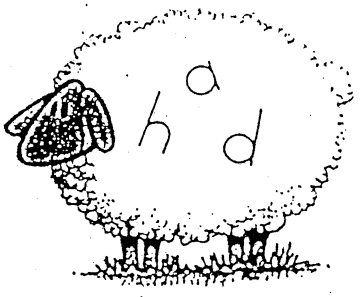
I ran in the race.

at
had
I
man
a
am
has
ran
cat
can

F Write the spelling words that are in the sheep.







the *

yes

get

red

mother *

let

bed

men

pet

fed

LESSON 15 Target: Short e

A Write the words for the meanings.

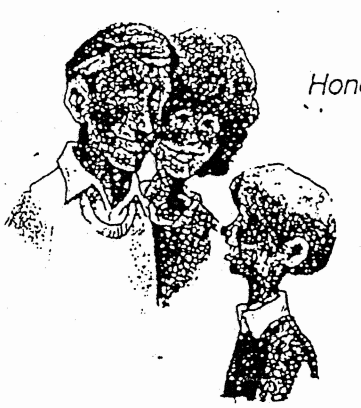
mom

a cot

a color

dog or cat

I can



Honor your father and mother.
— Ephesians 6:2

LESSON 15

B Find the spelling words. Write the words.

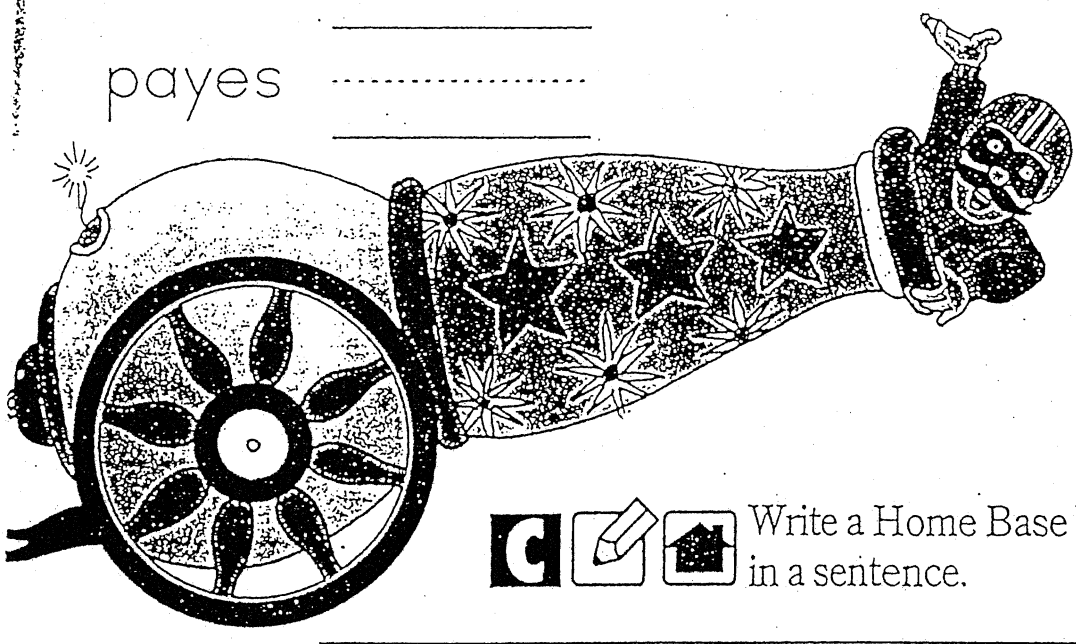
aleto _____ sredm _____

bdfed _____ thecf _____

oipet _____ kgeth _____

mensw _____ vbedr _____

payes _____



C Write a Home Base Word in a sentence.

_____

_____

_____

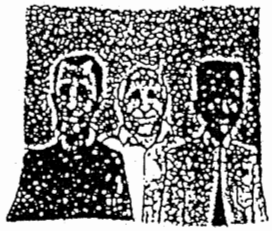
_____

_____

_____

the
yes
get
red
mother
let
bed
men
pet
fed

D Find the spelling word for the picture.
Write the spelling word.



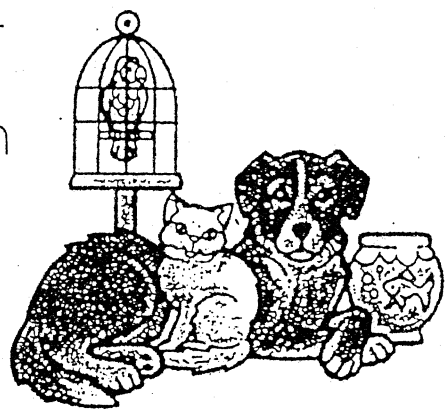
E Write the spelling words that rhyme.

jet _____ led _____ ten _____

LESSON 15

F Draw a picture of a pet.

dog hamster
horse gerbil
bird monkey
cat
fish



G Tell about the pet in your picture.

Appendix G

Lesson Plans: Implicit Group

Lesson One

Target Words: I a man ran can

Objectives: Children learned how to spell the target words through the use of three strategies: 1) sounding out words, imagery and analogy.

Materials: student segmenting sheets, blank floor tiles, plastic letters, file cards with target words printed on them.

Procedure:

Children were be told that words could be broken up into parts (phonemes) and that these parts could be represented by graphemes (letters).

The teacher demonstrated this principle. Children were shown segmenting sheets on which a sail boat was drawn. At the bottom of the page was an arrow (See Diagram). Blank tiles were placed on the boat. The teacher began by moving a tile for each sound that she made.

sound #1: "a" (as in "apple"). The teacher repeated the sound in a drawn out fashion "aaaaa" and moved one tile from the boat to the arrow.
sound #2: "a...a". The teacher repeated the first sound in a drawn out fashion and moved one tile down to the arrow, then, repeated the second sound in a drawn out fashion and moved one more tile down to the arrow.

The teacher now gave each child a segmenting sheet along with numerous blank tiles. The teacher gave the children another sound with which she modeled how to segment (sound:"a...a...a").
The children then modeled back the sound and the segmenting. The teacher then asked the children: "Does anyone know which letter makes an "a" sound?".

Children were now given tiles with the letter "a" written on them. Children were now given several other repeated "a" sounds to segment.

Appendix G

The same was done with the phoneme/grapheme "I".

Children now segmented the words "am", "at", and "cat", in the same way, first with blank tiles and then with letters.

Once children had segmented "am", "at" and "cat", they were asked to give back the segmenting sheets and to spell these three words again using the plastic letters.

The teacher now had the children look carefully at these words and helped them develop a picture of these words in their minds using the imagery strategy.
Children were presented with the target words printed on individual flash cards. These flash cards were presented one at a time. Children were told to read each word carefully paying close attention to the order of the letters in the word. Next, the children were instructed to close their eyes and imagine themselves at a movie theater. The children were told that they were to paint the target word onto the movie screen. They were to then imagine that the paint was magical paint and that the word on the screen was beginning to grow larger. The children were instructed to take a picture of the word with a pretend camera and place the picture into their photo albums. Children were then told to hold their images in their minds for as long as possible.

If children experienced difficulty holding their images in their minds, they were instructed to imagine that they were nailing up each letter of the word onto the screen. Next, children were told to imagine a flood light illuminating the letters of the word so brightly that the letters would not fade until the children dissolved their own images.

Children were now asked if there was anything similar about these words. Children noted that two of the words rhymed. Children were taught the principle that when two words rhymed, they tend to share the same spelling. Teacher and students created and spelled a list of words that rhymed with "at".

Appendix G

Lesson Plans: Implicit Group

Lesson Two

Target Words: had, has, man, ran, can

Objectives: Same as Lesson One

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

For review, children were asked to segment the words from lesson one: a, I, am, at, cat.
Children now segmented the words had, has, man, ran, and can. In each situation, the teacher modeled how to segment the words. Blank tiles were used first followed by segmenting with letters.

2. Children were now asked to look carefully at the target words presented to them on file cards. Children were instructed to create a mental picture of these words using the imagery strategy.

3. Once again, children were asked whether they noted any similarities between these words. Through the analogy strategy children created and spelled words that rhymed with "ran".

Appendix G

Lesson Plans: Implicit Group

Lesson Three

Target Words: the, mother, get, let, pet

Objectives: Same as Lesson One

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

Review: Children reviewed segmenting words by segmenting the new target words: get, let and pet.

Children were then taught that some sounds are represented by two letters. In this case, "th" makes one sound as in the words, "the" and "mother" and "er" as in "mother". Children then segmented these two words.

Through the strategy of imagery, children developed mental images of the words "the", "mother", and "get".

As in the past two lessons, children noted similarities through the analogy strategy. They created words that rhymed with "get".

Appendix G

Lesson Plans: Implicit Group

Lesson Four

Target Words: men, yes, red, bed, fed

Objectives: Same as Lesson One

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

For review, children were asked to segment the words from lesson one: the, mother, get, let, pet. Children now segmented the words men, yes, red, bed, and fed. In each situation, the teacher modeled how to segment the words. Blank tiles were used first followed by segmenting with letters.

2. Children were now asked to look carefully at the target words presented to them on file cards. Children were instructed to create a mental picture of these words using the imagery strategy.

3. Once again, children were asked whether they noted any similarities between these target words. Children created and spelled new words through the analogy strategy. They created and spelled words that rhymed with "red".

Appendix H

Lesson Plans: Explicit Group

Lesson One

Target Words: I a man ran can

Objectives: Children learned how to spell the target words through the use of three strategies: 1) sounding out words, imagery and analogy.

2. Children discussed the importance of these three strategies along five key features: 1) what the strategies are, 2) how to use them, 3) why we use them, 4) when and where to apply them and 5) how to measure their effectiveness.

Materials: student segmenting sheets, blank floor tiles, plastic letters, file cards with target words printed on them.

Procedure:

At the beginning of the lesson, children were told that they were going to learn three strategies that will help them to spell words. The instructor discussed that one way to spell a word was to sound it out. Children were told that they needed to pay attention to each sound that they hear in a word.

Children were told that words can be broken up into parts (phonemes) and that these parts can be represented by graphemes (letters). Children also discussed the importance of this strategy such as the fact that this strategy will help them to be aware of every sound that is in a word and to represent that sound with a letter or group of letters.

The teacher demonstrate this principle. Children were shown the segmenting sheets on which a sail boat is drawn. At the bottom of the page is an arrow (See Table 2). Blank tiles were placed on the boat. The teacher began by moving a tile for each sound that she made.

sound #1: "a" (as in "apple"). The teacher repeated the sound in a drawn out fashion "aaaaa" and moved one tile from the boat to the arrow. Sound #2: "a...a". The teacher repeated the first sound in a drawn out fashion and moved one tile down to the arrow, then, repeated the second sound in a drawn out fashion and moved one tile down to the arrow.

Appendix H

The teacher now gave each child a segmenting sheet along with numerous blank tiles. The teacher give the children another sound with which she modeled how to segment (sound:"a...a...a"). The children then modeled back the sound and the segmenting. Children were told that each sound could be represented by a letter. The teacher asked the children: "Does anyone know which letter makes an "a" sound?".

Children were now given tiles with the letter "a" written on them. Children were now given several other repeated "a" sounds to segment. The same was done with the phoneme/grapheme "I".

Children now segmented the words "am", "at", and "cat", in the same way, first with blank tiles and then with letters.

Once the children had segmented "am", "at" and "cat", they were asked to give back the segmenting sheets and to spell these three words again using the plastic letters.

The teacher and children now reviewed this strategy by discussing what the strategy was, why to use it, along with when and where to apply it.

The instructor now told the children that there was another way to remember how to spell a word. Children were told that if it wasn't helpful to sound out a word, then they could create a picture of the word in their mind and try to look at this picture when trying to spell.

The teacher now had the children look carefully at these words and help them develop a picture of these words in their minds using the imagery strategy.
Children were presented with the target words printed individually on flash cards. These flash cards were presented one at a time. Children were told to read each word carefully paying close attention to the order of the letters in the word. Next, the children were instructed to close their eyes and imagine that they were at a movie theater and that they were painting the word on the screen with black paint. They were then told that the paint was magical and that the word on the screen was getting bigger and bigger. They were then told to take a picture of the word with a pretend camera and place the picture in their photo albums. The children were then told to hold their images in their minds for as long as possible.

APPENDIX H

If children experienced difficulty holding their images in their minds, they were instructed to imagine that they were nailing up each letter of the word onto the screen. Next, children will be told to imagine a flood light illuminating the letters of the word so brightly that the letters would not fade until the children dissolved them themselves.
Again, children reviewed this strategy according to what it was, how to use it, when to use it, why and where to use it.

Children were now asked if there was anything similar about the target words. Children noted that two of the words rhymed. Children were taught the principle that when two words rhyme, they tend to share the same spelling.

The teacher explained the third strategy, analogy. She told the children that if they knew how to spell a certain word, that they could use the spelling of that word to spell a new word that rhymed with it. For example, if they know how to spell the word, "me" they could use it to spell the word, "he". Through this approach, the instructor and children created and spelled a list of words that rhymed with "at".

At this point, the instructor and students reviewed the three strategies, discussing what they were, that they are important for spelling and that they could use all of these strategies when they write in their journals, when they are given a spelling test and when they write a letter to their friend, etc. They then discussed what the three strategies were, how and when to use them and why.

Appendix H

Lesson Plans: Explicit Group

Lesson Two

Target Words: had, has, man, ran, can

Objectives: Same as Lesson One

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

For review, children were asked what the three strategies were that they could use to spell a word. The teacher then repeated what the three strategies were. Following this, the instructor outlined how to segment words into their sounds. For review, the children segmented the words from lesson one: a, I, am, at, cat.
Following this, the children segmented the new target words: had, has, man, ran, and can. In each situation, the teacher modeled how to segment the words. Blank tiles were used first followed by segmenting with letters. Once again, the teacher stated that when the children want to spell a word, they can listen to all the sounds that they hear in that word and represent these sounds with a letter. The teacher now asked the students to tell her another way that they could spell a word. The teacher then discussed with the children how to create a mental picture of a word and how they can think about this picture when they want to spell a word.

2. Children were now asked to look carefully at the target words presented to them on file cards. Children were instructed to create a mental picture of these words using the imagery strategy.

3. Once again, children were asked whether they noted any similarities between these target words. The teacher asked the students why it was important to know that these words rhymed and asked them how rhyme could help them spell a word. Through the use of analogy, children created and spelled new words that rhymed with the word, "man". Once again, the teacher reviewed the three strategies, discussing what they were, that they were important for spelling and that they could use all of these strategies then they write in their journals, when they are given a spelling test and when they write a letter to their friend, etc.

Appendix H

Lesson Plans: Explicit Group

Lesson Three

Target Words: the, mother, get, let, pet

Objectives: Same as Lesson One

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

For review, children were asked what the three strategies were that they could use to spell a word.

The teacher then repeated what the three strategies were. Following this, the instructor outlined how to segment words into their sounds. For review, the children segmented the words from the last lesson: has, had, man, can, ran. Children then segmented the new target words: get, let and pet. In each situation, the teacher modeled how to segment the words. Blank tiles were used first followed by segmenting with letters. Once again, the teacher stated that when the children want to spell a word, they can listen to all the sounds that they hear in that word and represent these sounds with a letter.
Children were then taught that some sounds are represented by two letters. In this case, "th" makes one sound as in the words, "the" and "mother" and "er" as in "mother". Children then segmented these two words. The teacher now asked the students to tell her another way that they could spell a word. The teacher then discussed with the children how to create a mental picture of a word and how they can think about this picture when they want to spell a word.

2. Children were now asked to look carefully at the target words presented to them on file cards. Through the strategy of imagery, children developed mental images of the words "the", "mother", and "get".
As in the past two lessons, children noted similarities in words through rhyme and created and spelled new words through the analogy strategy. The teacher asked the students why it is important to know that these words rhyme and ask them how rhyme could help them spell a word. Through the use of analogy, children created and spelled new words that rhymed with the word, "get".
Once again, the teacher reviewed the three strategies, discussing what they are, that they are important for

spelling and that they could use all of these strategies when they write in their journals, when they are given a spelling test and when they write a letter to their friend, etc.

Appendix H

Lesson 4: Explicit Group

Target Words: men, yes, red, bed, fed

Objective: Same as Lesson one

Materials: Same as Lesson One; new target words printed on file cards.

Procedure:

For review, children were asked what the three strategies were that they could use to spell a word.

The teacher then repeated what the three strategies were. Following this, the instructor outlined how to segment words into their sounds. For review, the children segmented the words from the last lesson: the, mother, get, let, pet. Children then segmented the new target words: red, bed, fed, men, yes. In each situation, the teacher modeled how to segment the words. Blank tiles were used first followed by segmenting with letters. Once again, the teacher stated that when the children want to spell a word, they can listen to all the sounds that they hear in that word and represent these sounds with a letter. Children also reviewed that some sounds are represented by two letters. In this case, "th" makes one sound as in the words, "the" and "mother" and "er" as in "mother".
The teacher now asked the students to tell her another way that they could spell a word. The teacher then discussed with the children how to create a mental picture of a word and how they can think about this picture when they want to spell a word.

2. Children were asked to look carefully at the target words presented to them on file cards. Through the strategy of imagery, children developed mental images of the words "red", "men", and "yes". As in the past two lessons, children noted similarities in words through rhyme and created and spelled new words through the analogy strategy. The teacher asked the students why it is important to know that these words rhyme and ask them how rhyme could help them spell a word. Through the use of analogy, children created and spelled new words that rhymed with the word, "red". Once again, the teacher reviewed the three strategies, discussing what they were, that they were important for spelling and that they could use all of these strategies when they write in their journals, when they are given a spelling test and when they write a letter to their friend, etc.